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# United States Air Force

# Soil Vapor Extraction at the Jet Engine Buildup Shop


Loring Air Force Base

STARTUP REPORT

DRAFT



May 1999

# Loring Air Force Base

## SOIL VAPOR EXTRACTION AT THE JET ENGINE BUILDUP SHOP

## STARTUP REPORT

## DRAFT

Prepared for:
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## ACRONYMS AND INITIALISMS

| | |
|---|---|
| AEW | air extraction well |
| AFB | Air Force Base |
| AFBCA | Air Force Base Conversion Agency |
| AFCEE | Air Force Center for Environmental Excellence |
| AIW | air injection well |
| ARAR | applicable or relevant and appropriate requirements |
| BEI | Bechtel Environmental, Inc. |
| bgs | below ground surface |
| EE/CA | Engineering Evaluation/Cost Analysis |
| EPA | U.S. Environmental Protection Agency |
| ES | Entomology Shop |
| JEBS | Jet Engine Buildup Shop |
| MP | monitoring point |
| MDEP | Maine Department of Environmental Protection |
| PAV | passive air vent |
| PID | photo ionization detector |
| PRG | preliminary remediation goal |
| PVC | polyvinyl chloride |
| RAWP | Removal Action Work Plan |
| SVE | soil vapor extraction |
| TCE | trichloroethene |
| TVOC | total volatile organic compounds |

## UNITS OF MEASURE

| | |
|---|---|
| cfm | cubic feet per minute |
| in. | inch/inches |
| in $H_20$ | inches of water |
| in. Hg | inches of mercury |
| ft | feet |
| $ft^2$ | square feet |
| gal | gallon |
| kg | kilogram |
| lbs | pounds |
| µg | microgram |
| ppm | parts per million |
| ppmv | parts per million (volume basis) |
| rpm | revolutions per minute |
| scfm | standard cubic feet per minute |
| $yd^3$ | cubic yard |

# 1.0 INTRODUCTION

The Air Force intends to perform removal actions of contaminated surface and subsurface soil at Loring Air Force Base (AFB) in Limestone, Maine. These removal actions will comply with a Federal Facilities Agreement between Region I U.S. Environmental Protection Agency (EPA), the Maine Department of Environmental Protection (MDEP), and the U.S. Air Force signed on January 30, 1991. Bechtel Environmental, Inc. (BEI) has been contracted by the Air Force Center for Environmental Excellence (AFCEE) as the removal action contractor for Loring AFB under Prime Contract No. F41624-94-D-8072.

This startup report documents the construction and startup (first month of operation) of a Soil Vapor Extraction (SVE) system at the Jet Engine Buildup Shop (JEBS). The SVE system will provide subsurface remediation for the area contaminated with trichloroethene (TCE). The system includes blower/vacuum unit, SVE wells, monitoring points (MPs), and piping.

# 2.0 SITE BACKGROUND

## 2.1 SITE DESCRIPTION AND BACKGROUND

Loring AFB is located in Aroostook County in the northeastern corner of Maine about 3 miles from the Canadian border (see Figure 2-1). The base occupies about 9,000 acres near the town of Limestone, Maine. The base was constructed between 1946 and 1953, and improvements were made throughout its operational life. Most recently, the base was part of the Air Combat Command. On September 30, 1994, Loring AFB was officially closed and is now the responsibility of the Air Force Base Conversion Agency (AFBCA). The JEBS site is located west of the flightline in the south-central industrial area of the Base (Figure 2-2).

The geology of the Loring site consists of overburden soils containing glacial till and reworked glacial till that have been used as fill materials. The thickness of the soils is variable between the different operable units but is generally between 10 and 30 ft thick. Bedrock at the site is a well-cemented, highly fractured, weathered limestone of the Carys Mills Formation that generally dips to the west (URS 1995).

Groundwater at the JEBS is present in both the overburden and the bedrock. Groundwater in the overburden is generally unconfined, discontinuous, and often perched. The depth to groundwater in the overburden is generally about 10 to 20 ft below ground surface (bgs). Groundwater flow direction within the overburden appears to be predominantly to the south-southwest. Groundwater in the bedrock primarily occurs in the secondary porosity features such as fractures and bedding planes. Groundwater in the bedrock aquifer is under unconfined to semiconfined conditions and groundwater flow is controlled by fracture orientation, which primarily trends northeast and northwest. Vertical flow in the bedrock aquifer is generally upward (URS 1995).

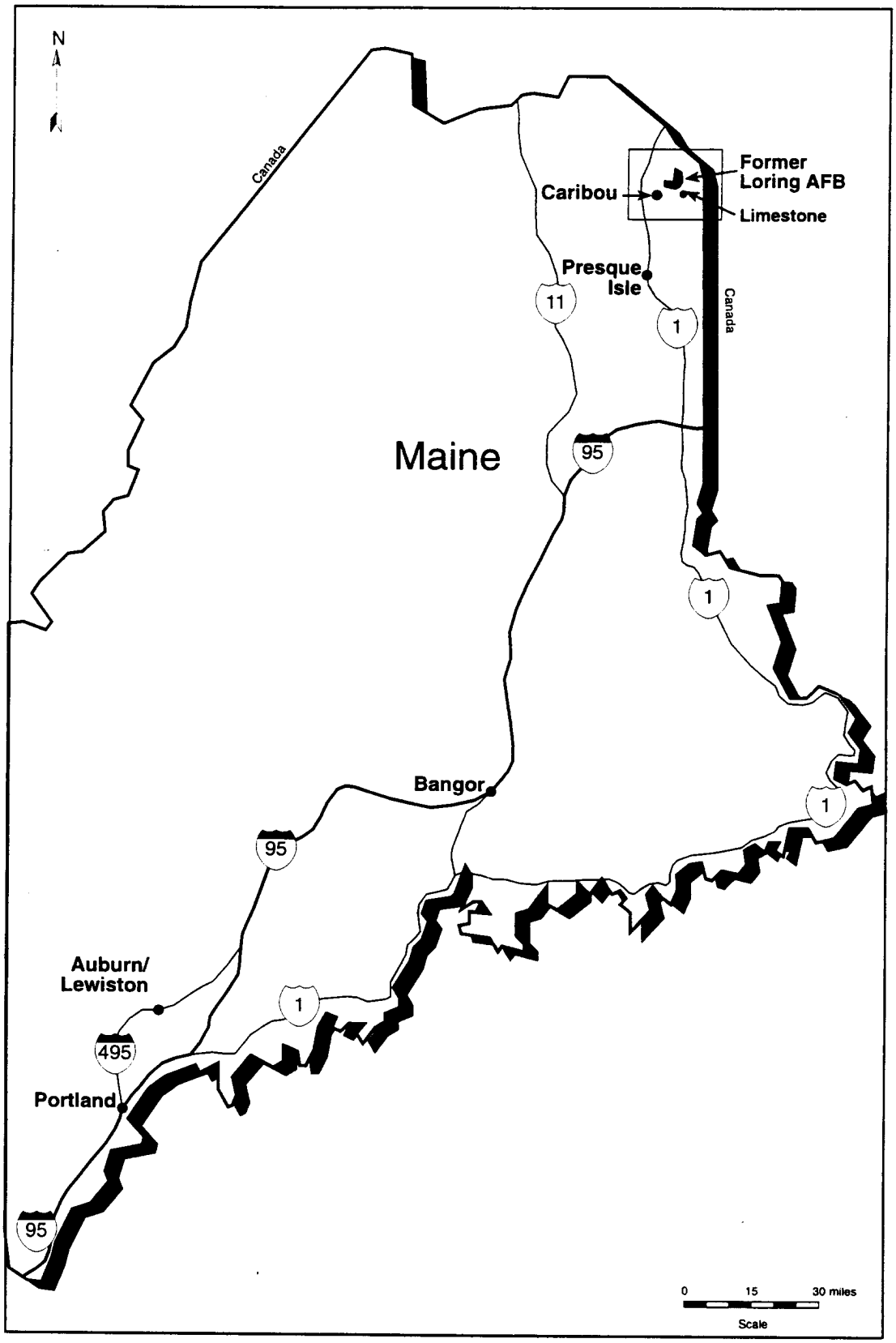


**Figure 2-1**
Loring Air Force Base Location Map

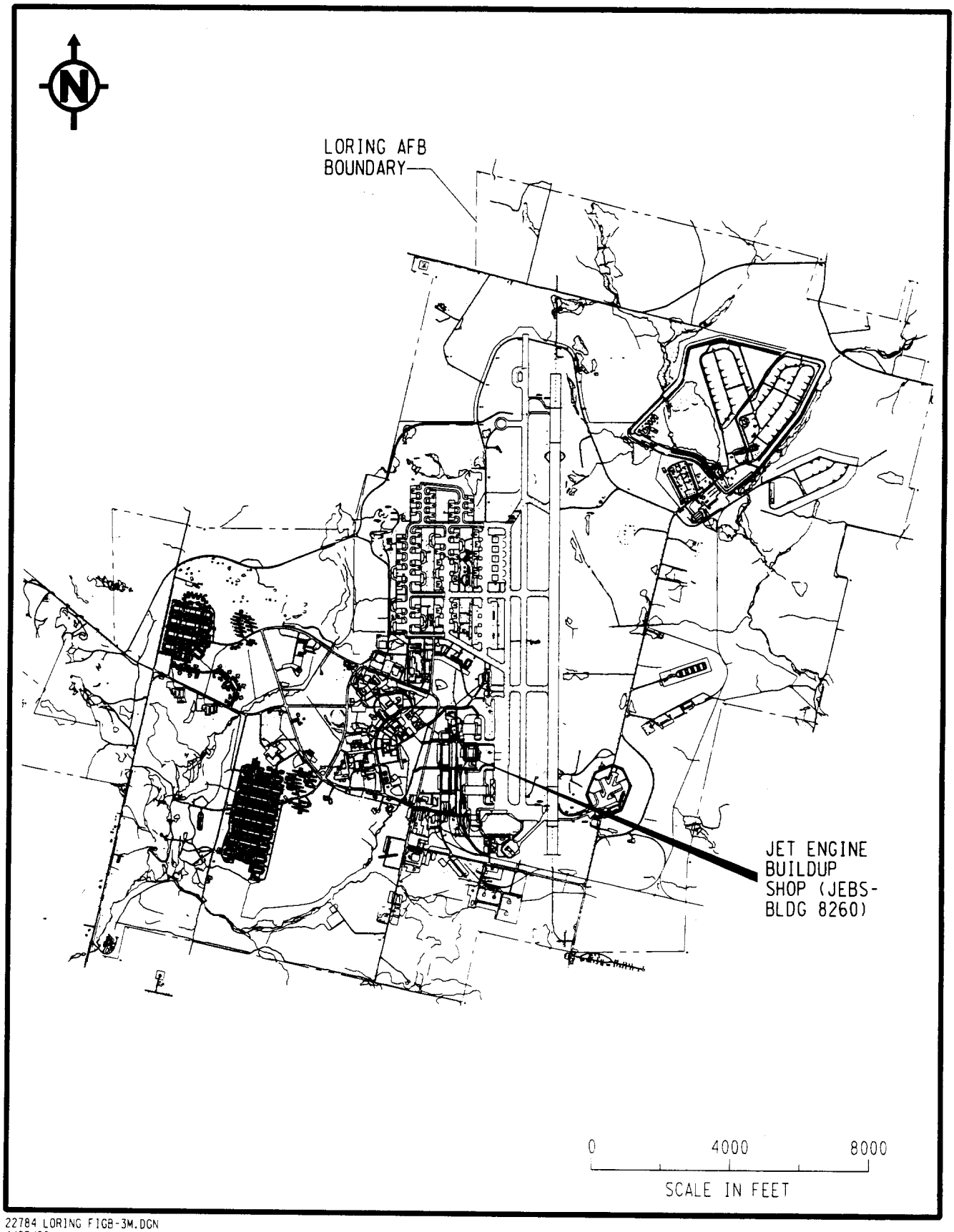


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Figure 2-2
Loring Air Force Base

## 2.2 NATURE AND EXTENT OF CONTAMINATION

TCE has been detected at the JEBS site at concentrations that may impact groundwater to levels above regulatory criteria *[Engineering Evaluation/Cost Analysis (EE/CA) for JEBS and Building 8710, Bechtel 1998a].* As the primary contaminant of concern, TCE defines the limits of the removal action. TCE concentrations at the North, South and Southeast JEBS areas are shown on Figure 2-3. The volume of soil to be remediated was calculated in the EE/CA to be 49,665 $yd^3$ and the amount of TCE in that soil was calculated using arithmetic means of soil TCE concentrations to be 819 lbs.

## 2.3 REGULATORY SETTING

The removal actions being performed at Loring AFB are authorized under the Comprehensive Environmental Response, Compensation, and Liability Act, Section 104. The removal action design is based on the EE/CA. The EE/CA presents a complete discussion of applicable or relevant and appropriate requirements (ARARs) for this removal action. These ARARs were incorporated into the design and planning of the JEBS site action.

## 2.4 CLEANUP CRITERIA

The EE/CA presented broad removal action objectives that would prevent leachate generated from soil contaminated in excess of the preliminary remediation goal (PRGs) from migrating to groundwater at concentrations greater than ARARs. Specific performance objectives presented in the EE/CA are as follows:

Treat contaminated soil for TCE using an in situ SVE process to an action level of :

- 950 µg/kg at the North JEBS area
- 500 µg/kg at the South JEBS area
- 530 µg/kg at the Southwest JEBS area

# 3.0 CHRONOLOGY OF EVENTS

The following presents the chronology of events involved in the construction and startup of the JEBS SVE system:

| DATE | EVENT |
|---|---|
| 8/27/98 | Geoprobe sampling to delineate extent of contamination |
| 8/31-9/14/98 | Construct air extraction and passive wells and MPs |

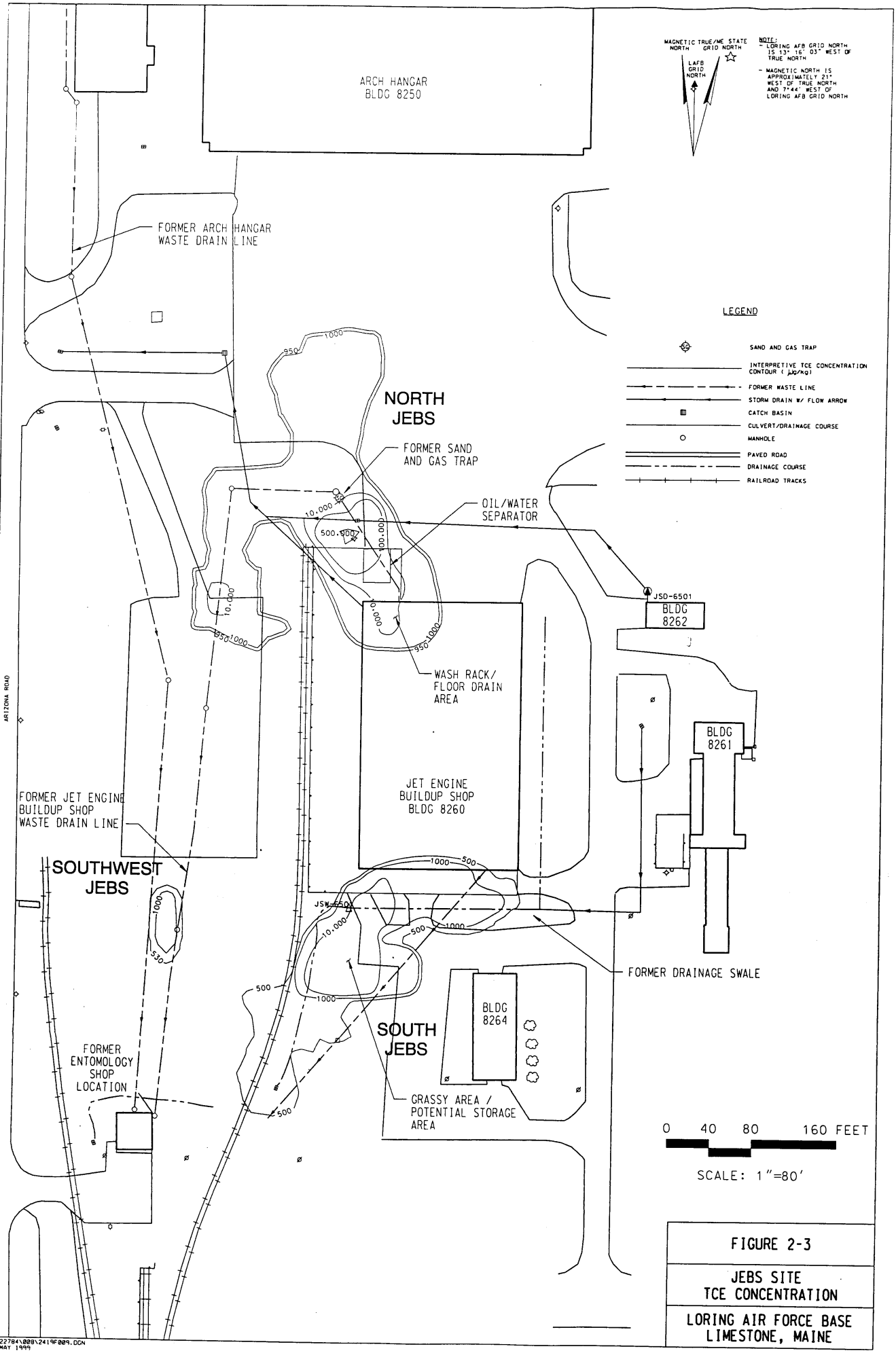


FIGURE 2-3

JEBS SITE
TCE CONCENTRATION

LORING AIR FORCE BASE
LIMESTONE, MAINE

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17 MAY 1999

| DATE | EVENT |
|---|---|
| 9/4/98 | Geoprobe sampling to delineate extent of contamination inside south end of JEBS building |
| 9/26-27/98 | Construct well head and service loop manifolds |
| 9/27-10/22/98 | Construct piping to connect SVE wells |
| 10/19/98 | SVE equipment inspection at subcontractors plant (Appendix C) |
| 10/22/98 | Move biovent equipment from Entomology Shop (ES) biovent building to Nose Dock 28 for storage and convert building to JEBS SVE system service building |
| 10/26/98 | Process equipment delivered and installed in service building |
| 10/27/98 | Hook well head piping to system blower |
| 10/27/98 | Electrical hookup of system |
| 10/30/98 | Obtain background data total volatile organic compounds (TVOC) from air extraction wells (AEWs) |
| 11/2/98 | System startup begins (30 day startup period) |
| 12/2/98 | Begin normal operation and maintenance period |

## 4.0 SOIL SAMPLING

Prior to construction, BEI was requested by the Air Force to confirm that the aerial extent of contamination had been determined and that contamination did not extend beneath the south end for the JEBS building. Geoprobe sampling was performed at 10 locations (Figure 4-1) in accordance with *Soil Vapor Extraction at the Jet Engine Buildup Shop, Removal Action Work Plan, Final* (Bechtel 1998b). Borehole logs and headspace results are included in Appendix A. Laboratory analysis results are presented in Table 4-1. No system design changes were indicated by the sampling results from perimeter borings PB-1 to PB–8 since no cleanup levels were exceeded. The detection limits for samples collected from perimeter borings PB-9 and PB-10 are higher than the action level in that area. Those sample locations are within the area of influence of system. No additional action is recommended at this time.

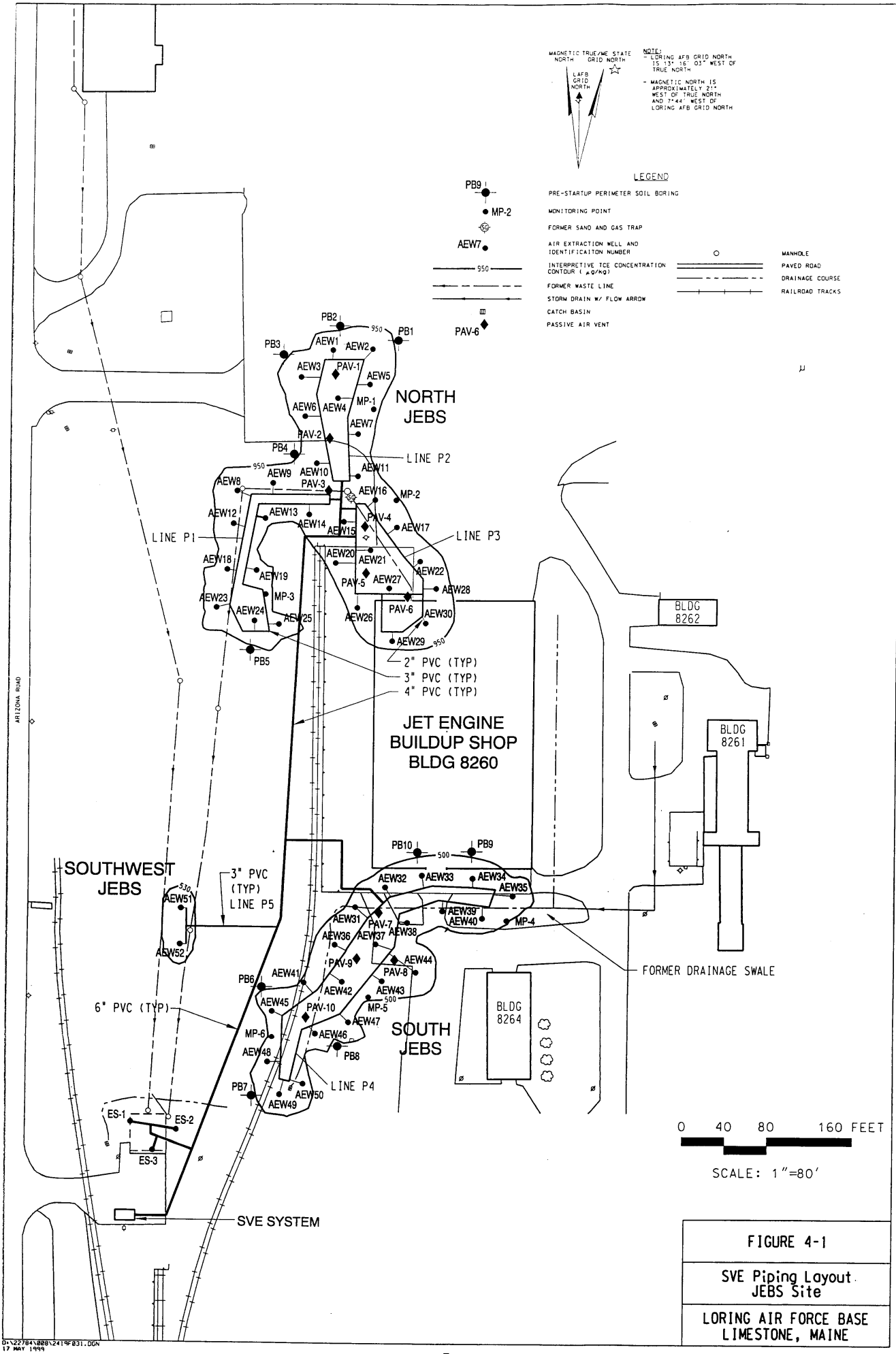


FIGURE 4-1

SVE Piping Layout
JEBS Site

LORING AIR FORCE BASE
LIMESTONE, MAINE

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17 MAY 1999

## Table 4-1
## JEBS Soil Sampling Analytical Results

| BORING | SAMPLE DEPTH (ft) | DETECTION LIMIT ug/kg | TCE CONCENTRATION ug/kg | ACTION LEVEL ug/kg |
|---|---|---|---|---|
| PB-1 | 16-17 | 220 | 280 | 950 |
| PB-2 | 18-20 | 190 | 300 | 950 |
| PB-3 | 16-18 | 190 | 250 | 950 |
| PB-4 | 16-17 | 220 | 860 | 950 |
| PB-5 | 14-16 | 220 | non detect | 950 |
| PB-6 | 14.5-16 | 200 | non detect | 500 |
| PB-7 | 11-12 | 190 | non detect | 500 |
| PB-8 | 12-14 | 160 | non detect | 500 |
| PB-9 | 16-16.5 | 920 | non detect | 500 |
| PB-10 | 11-12.5 | 950 | non detect | 500 |

## 5.0 SYSTEM INSTALLATION

The SVE system consists of 55 AEWs, 10 passive air vents (PAVs), 12 MPs, piping, and blower/vacuum system. Three of the AEWs are converted biovent air injection wells (AIW) previously installed at the former ES biovent system. These were added to the SVE system to complete cleanup of TCE contamination at this site.

### 5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION

The AEWS, PAVs, and MPs were installed by a drilling subcontractor as the initial step in construction of the SVE system. Wellhead units were assembled and installed by the BEI field staff. All activities were supervised by a BEI onsite geologist who recorded the drilling activities and subsurface information in a logbook. Boring logs and well completion reports of each AEW, PAV, and MP installed are provided in Appendix B. Well and MP locations are shown on Figure 4-1.

The AEWs were installed as specified in the *Soil Vapor Extraction at the JEBS Removal Action Work Plan* (Bechtel 1998b). Each well was completed, packed with sand around the screened intervals, sealed with a bentonite plug, and grouted with EZmud/Benseal. Above-grade well completion's were installed as specified in the Removal Action Work Plan (RAWP) (Bechtel 1998b).

There were a total of 52 AEWs and 10 PAVs installed over an area of approximately 67,000 $ft^2$ to depths of 11.2 to 27.0 ft bgs. Two wells were installed inside the JEBS building. Well completions were all above grade mountings, with a 2-in. polyvinyl chloride (PVC) riser and a PVC screened interval at the bottom of each well.

A total of 12 MPs were installed in 6 locations to depths of 7 to 18 ft bgs (see Table 6-3 for installed depths). All MPs were in clusters of two points at one location. The MPs were constructed of 1/4 in. PVC tubing with a 6-in. wire-wrapped stainless steel, slotted screen. Completions are all below-grade mountings.

Three ES biovent AIWs were converted to SVE wells by manifolding them into the JEBS system. These wells will be used to complete remediation of the ES site. Confirmation sampling at this site showed that a small area of TCE contamination remained (Bechtel 1998c). Because biovent AIWs were designed using a radius of influence of 32 ft and SVE wells used a radius of influence of 25 ft, the coverage of the contaminated area by the three converted wells was checked using a radius of influence of 25 ft. This preliminary evaluation indicates that there may be enough overlapping coverage to complete remediation without adding wells, however, additional flow and pressure data from this area under better operating conditions will be required to make a final judgment (high water table limited flow capacity during the start-up period). Action level at the ES is 540 µg/kg for TCE.

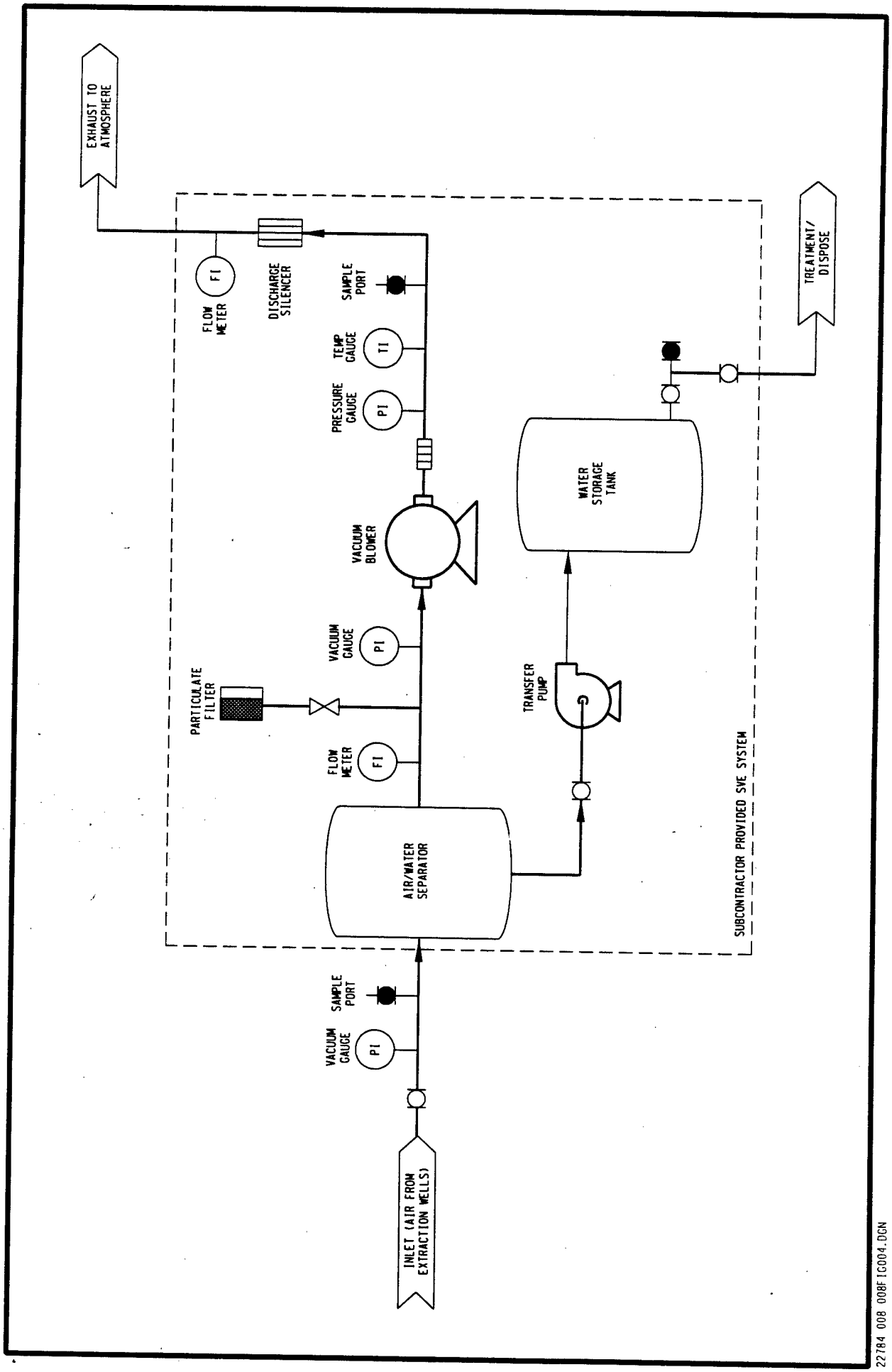


Figure 5-1
Vapor Extraction Diagram
Loring Air Force Base

# 6.0 STARTUP

## 6.1 PRE-STARTUP CHECKOUT

Before startup, a complete system check was performed to verify that the blower system was properly connected to the piping system, proper electrical connections had been made, and blowers and motors were properly lubricated.

## 6.2 PRE-STARTUP TESTING

Before actual operation, the blower system was started to check for air leaks and to ensure that gauges and meters worked properly, and the system delivered the proper flow and vacuum. The system and piping was checked for air leaks with the wells shut off to create maximum vacuum inside the piping.

## 6.3 BASELINE SAMPLING

Baseline sampling of soil gas was performed before the system was started. Soil gas was sampled at each AEW and analyzed for TVOC using field instrumentation. Each well was purged of one well volume of air before sampling. These data are presented in Table 6-1. Baseline sampling was done to provide data on prestartup soil gas contamination levels. These data will be used for comparison to future data obtained under similar static conditions (equilibrium) of the system being shut down. This will provide an indication of how cleanup is progressing.

## 6.4 STARTUP

Startup took place between November 2, 1998 and December 2, 1998. Startup activities were performed to assess and maximize the performance of the SVE system and to determine if emissions controls need to be implemented. The following activities were performed during the system startup period:

- Measure AEW flow rates and vacuums and adjust to meet design where possible
- Measure vacuum in the MPs
- Record blower system performance data including flow and vacuum
- Monitor and quantify vapor emissions
- Management of groundwater drawn into the system during normal operation.

### 6.4.1 Air Extraction Well Data

TVOC data from the AEWs was collected once during the startup period. This data is shown on Table 6-2. These data will be compared to data obtained in a similar manner while the system is running to adjust individual well flows and balance the system. Air extraction well flow and

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# Table 6-2

## AEW Sampling
## Total Volatile Organic Compounds

| WELL NUMBER | WELL DEPTH (ft from top of valve) | DEPTH TO TOP OF SCREEN (ft from top of valve) | TVOC (ppm) |
|---|---|---|---|
| | | | 11/9/98 |
| AEW-1 | 18.85 | 7.85 | off |
| AEW-2 | 21.90 | 7.90 | 16.8 |
| AEW-3 | 20.75 | 7.75 | off |
| AEW-4 | 22.40 | 7.90 | 32.2 |
| AEW-5 | 18.90 | 7.90 | 3.1 |
| AEW-6 | 20.50 | 5.00 | 4.6 |
| AEW-7 | 23.45 | 8.45 | 5.2 |
| AEW-8 | 20.35 | 8.35 | 8.9 |
| AEW-9 | 22.15 | 8.15 | 37.4 |
| AEW-10 | 23.15 | 8.15 | 40.1 |
| AEW-11 | 23.60 | 8.60 | 26.1 |
| AEW-12 | 22.15 | 8.15 | 15.4 |
| AEW-13 | 20.70 | 7.70 | 42.6 |
| AEW-14 | 23.05 | 8.05 | 169 |
| AEW-15 | 18.00 | 8.00 | 1.7 |
| AEW-16 | 14.00 | 8.00 | 2 |
| AEW-17 | 20.25 | 7.75 | 19.1 |
| AEW-18 | 17.25 | 8.25 | 16.9 |
| AEW-19 | 20.00 | 8.00 | 33.6 |
| AEW-20 | 22.85 | 7.85 | 114 |
| AEW-21 | 18.90 | 7.90 | 1.2 |
| AEW-22 | 17.65 | 7.65 | 2.7 |
| AEW-23 | 18.10 | 7.60 | 36.1 |
| AEW-24 | 11.15 | 8.15 | 73.5 |
| AEW-25 | 15.30 | 8.30 | off |
| AEW-26 | 18.00 | 8.00 | 5.6 |
| AEW-27 | 18.70 | 7.70 | 9 |
| AEW-28 | 18.15 | 7.65 | 1.2 |
| AEW-29 | 18.25 | 8.25 | 2.4 |
| AEW-30 | 20.60 | 8.60 | 10.4 |
| AEW-31 | 21.15 | 7.65 | off |
| AEW-32 | 20.85 | 7.85 | 3.1 |
| AEW-33 | 20.35 | 7.85 | 41.2 |
| AEW-34 | 18.80 | 7.80 | 25.2 |
| AEW-35 | 20.35 | 7.85 | 61.2 |
| AEW-36 | 18.60 | 7.60 | 32.5 |
| AEW-37 | 23.45 | 8.45 | 92.4 |
| AEW-38 | 22.85 | 8.85 | 35 |
| AEW-39 | 27.00 | 12.00 | 45.1 |
| AEW-40 | 20.70 | 7.70 | 36.1 |
| AEW-41 | 19.65 | 7.65 | 49.1 |
| AEW-42 | 14.85 | 7.69 | 21.2 |
| AEW-43 | 24.20 | 9.20 | 61.6 |
| AEW-44 | 23.00 | 8.50 | 3 |
| AEW-45 | 18.85 | 7.85 | off |
| AEW-46 | 19.15 | 8.15 | 17 |
| AEW-47 | 23.15 | 8.15 | 3.1 |
| AEW-48 | 19.06 | 8.05 | off |
| AEW-49 | 19.10 | 7.60 | off |
| AEW-50 | 18.35 | 7.85 | off |
| AEW-51 | 23.75 | 8.75 | 10.2 |
| AEW-52 | 23.40 | 8.40 | off |
| ES-1(AIW-2) | 17.45 | 12.45 | off |
| ES-2(AIW-3) | 14.90 | 9.90 | 28.3 |
| ES-3(AIW-7) | 17.45 | 12.45 | 36.7 |

# Table 6-3
## SVE Well Flow and Vacuum Data

| WELL NUMBER | WELL DEPTH (ft from tov[1]) | DEPTH TO TOP OF SCREEN (ft from tov[1]) | 11/6/98 | | 11/9/98 | | 11/13/98 | | 11/17/98 | | 11/19/98 | | 11/23/98 | | 11/30/98 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) | VACUUM (in $H_2O$) | FLOW (scfm) |
| AEW-1 | 18.85 | 7.85 | Note [2] | 0 | | 2.9 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-2 | 21.90 | 7.90 | | 10.7 | | 9.6 | 5 | 0 | 5 | 13.9 | 5 | 1.5 | 0.3 | 0 | 29 | 19.1 |
| AEW-3 | 20.75 | 7.75 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-4 | 22.40 | 7.90 | | 12.7 | | 10 | 0.9 | 0 | frozen | 0 | frozen | 0 | frozen | 0 | 4.2 | 13.6 |
| AEW-5 | 18.90 | 7.90 | | 11.7 | | 9.6 | 2.8 | 0 | frozen | 0 | frozen | 0 | frozen | 0 | frozen | 0 |
| AEW-6 | 20.50 | 5.00 | | 8.4 | | 9.5 | 5 | 0 | frozen | 0 | frozen | 0 | frozen | 0 | frozen | 0 |
| AEW-7 | 23.45 | 8.45 | | 11.5 | | 12.1 | 5 | 12.7 | 4.7 | 13.1 | 2.5 | 14.2 | 2.3 | 16.3 | 3.8 | 15.4 |
| AEW-8 | 20.35 | 8.35 | | 11 | | 11.5 | 5 | 4.3 | 29.5 | 5.8 | 49 | 15.3 | 0.7 | 0 | 34 | 3.1 |
| AEW-9 | 22.15 | 8.15 | | 12.4 | | 13.9 | 6 | 0 | 26 | 13.4 | 27 | 13.1 | 0.69 | 0 | 34 | 0 |
| AEW-10 | 23.15 | 8.15 | | 11.9 | | 10.4 | 5 | 0 | 29 | 13.2 | 32 | 15.2 | 2.2 | 5.4 | 33 | 12.6 |
| AEW-11 | 23.60 | 8.60 | | 12 | | 8.8 | 5 | 9.4 | frozen | 10.3 | 5 | 15.6 | 2.3 | 8 | 4.3 | 13.7 |
| AEW-12 | 22.15 | 8.15 | | 10.9 | | 8.9 | 1.1 | 0 | 1.3 | 0 | frozen | 0 | frozen | 0 | frozen | 0 |
| AEW-13 | 20.70 | 7.70 | | 10.3 | | 12.3 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-14 | 23.05 | 8.05 | | 3.7 | | 5 | 6 | 0 | frozen | 3.1 | 50 | 7.7 | 0.19 | 0 | 34 | 0 |
| AEW-15 | 18.00 | 8.00 | | 10.2 | | 11.2 | 5 | 4.9 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-16 | 14.00 | 8.00 | | 3 | | 13 | 5.5 | 3.3 | 30 | 11.5 | 44 | 9.8 | 0 | 0 | 33 | 11.1 |
| AEW-17 | 20.25 | 7.75 | | 10.1 | | 10.6 | 4.6 | 13.6 | 5 | 12.6 | 1.6 | 10.1 | 0.94 | 7.5 | frozen | 0 |
| AEW-18 | 17.25 | 8.25 | | 0 | | 0 | 6 | 0 | 30 | 0 | off-water | 0 | frozen | 0 | frozen | 0 |
| AEW-19 | 20.00 | 8.00 | | 9.3 | | 12.7 | 2.5 | 10.5 | 3.8 | 10.4 | 2 | 10.5 | 0.7 | 11.3 | frozen | 0 |
| AEW-20 | 22.85 | 7.85 | | 9.2 | | 11.4 | 2.6 | 11.6 | 5 | 12.3 | 1.7 | 10.8 | 1 | 8.8 | 27 | 16.3 |
| AEW-21 | 18.90 | 7.90 | | 10.7 | | 8.9 | 0.02 | 0 | frozen | 0 | broken | 0 | broken | 0 | broken | 0 |
| AEW-22 | 17.65 | 7.65 | | 5 | | 11.7 | 5.5 | 10.2 | 2.7 | 8.8 | 0.65 | 4.2 | 0.98 | 7.8 | frozen | 0 |
| AEW-23 | 18.10 | 7.60 | | 0 | | 9.5 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-24 | 11.15 | 8.15 | | 0 | | 3.5 | 6 | 10.9 | frozen | 25.3 | 43 | 6 | 0.7 | 0 | frozen | 0 |
| AEW-25 | 15.30 | 8.30 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 | off-water | 0 |
| AEW-26 | 18.00 | 8.00 | | 0 | | 2.5 | 4.5 | 7.2 | 26 | 0 | 1.7 | 3.4 | 1 | 4.5 | 27 | 3.6 |
| AEW-27 | 18.70 | 7.70 | | 11.3 | | 9.9 | 4.5 | 8.6 | frozen | 0 | frozen | 0 | frozen | 0 | broken | 0 |
| AEW-28 | 18.15 | 7.65 | | 11 | | 12.4 | 2.8 | 0 | frozen | 0 | frozen | 0 | frozen | 0 | frozen | 0 |

**Table 6-4**
**Monitoring Point Data**

| Monitoring Point Number | Depth to Bottom of Screen (ft) | Vacuum (in. of $H_20$) | |
|---|---|---|---|
| | | 11-13-98 | 12-1-98 |
| MP-1-7 | 7 | .08 | 0 |
| MP-1-17 | 17 | .82 | .66 |
| MP-2-7 | 7 | .91 | 0 |
| MP-2-10 | 10 | .90 | .90 |
| MP-3-7 | 7 | .90 | .90 |
| MP-3-16 | 16 | .61 | .58 |
| MP-4-7 | 7 | 0 | 0 |
| MP-4-16 | 16 | .90 | .84 |
| MP-5-7 | 7 | .09 | 0 |
| MP-5-18 | 18 | 1.00 | .82 |
| MP-6-7 | 7 | 0 | 0 |
| MP-6-13 | 13 | 4.60 | 4.30 |

**Table 6-5**
**System Flow**

| Date | Total Influent Flow (scfm)[1] | Total Effluent Flow (scfm)[2] |
|---|---|---|
| 11-6-98 | 362 | 860 |
| 11-7-98 | 360 | 860 |
| 11-9-98 | 360 | 860 |
| 11-18-98 | 282 | 860 |
| 11-25-98 | 101 | 860 |
| 11-30-98 | 215 | 860 |
| 12-2-98 | 215 | 860 |

[1] Total flow calculated from individual well measurements.
[2] Flow = velocity × cross-section area. Velocity measured with a hot wire anemometer.

# Table 6-6
# Emissions Data

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Date Sampled | Number of Air Extraction Well In Operation | Effluent Level PID - ppmv | Effluent TCE Concentration - ppmv | System Effluent Flow, acfm | Effluent Temperature, C | Effluent Pressure, atm | Non-ideal volume @ temp. and pressure | mg_TCE /m3 per ppmv | TCE Emission, lbs/day |
| 11/9/1998 | 39 | 15 | 33 | 860 | 60 | 1.01 | 27 | 5.61 | 14.28 |
| 11/13/1998 | 25 | 40 | 96 | 860 | 60 | 1.01 | 27 | 5.61 | 41.55 |
| 11/25/1998 | 14 | 6.5 | 37 | 860 | 60 | 1.01 | 27 | 5.61 | 16.02 |
| 12/2/1998 | 17 | 5.3 | 15 | 860 | 60 | 1.01 | 27 | 5.61 | 6.49 |

**Notes**

*Column 1*: vapor volatile organic concentration measured at SVE blower discharge by photoionization detector (PID) in parts per million on a volume basis (ppmv)
*Column 2*: vapor volatile organic concentration measured at SVE blower discharge by analytical laboratory in parts per million on a volume basis (ppmv)
*Column 3*: SVE effluent flow - measured by hot wire anemometer
*Column 4*: SVE effluent flow temperature in degrees C
*Column 5*: SVE effluent pressure in psi
*Column 6*: molar volume of gas, calculated as follows:
*Molecular weight of TCE = 151.5 x10$^3$*

$$v = \frac{nRT}{p}$$

where:
v = liters of gas per mole @ temperature and pressure
n = number of moles
T = temperature, degrees K
p = pressure, atm
R =0.0821 L-atm/mol-K

*Column 7*: Conversion factor for ppmv to mg/m3 as follows:

$$\frac{1ppmv}{TCE} = \frac{1moleTCE}{10^6 moleair@333K;1.0atm} = \frac{151.5x10^3 TCE}{10^6 (Column\_6x10^{-3})}$$

*Column 8*: pounds per day TCE emitted calculated as follows:

$$\frac{lbs}{day} = Column\_3(\frac{ft^3}{\min})xColumn\_2(ppmv)x\frac{m^3}{35.31ft^3}xColumn\_7(\frac{mg}{m^3}per\_ppmv)x(\frac{kg}{10^6 mg})x2.2\frac{lbs}{kg}x1440\frac{\min}{day}$$

Example Calculation (for 11/9/98 data):

1. Molar volume:

$$v = \frac{1\_mol(0.0821)(333K)}{1.01\_atm}$$

v = 27 L

2. Convert ppmv to mg/m3:

$$\frac{1\_ppmv}{TCE} = \frac{151.5x10^3}{10^6 (27x10^{-3} m^3)}$$

1 ppmv = 5.61 mg-TCE/m3

3. Calculate TCE emissions, lbs/day:

$$\frac{lbs}{day} = 860(\frac{ft^3}{\min})x33(ppmv)x\frac{m^3}{35.31ft^3}x5.61(\frac{mg}{m^3}per\_ppmv)x(\frac{kg}{10^6 mg})x2.2\frac{lbs}{kg}x1440\frac{\min}{day}$$

lbs/day = 14.28

## 8.0 RECOMMENDATIONS

1. If the number of wells allowing flow remains at a low level, shut the system down for the rest of the winter months and restart in the spring.

2. When more wells become operational (in the spring), monitor groundwater levels on a more frequent basis to determine if the perched zones can be dried out and maintained relatively dry by the SVE system.

3. Continuing evaluation of the system operation during normal operations.

4. Evaluate the need for a full or partial surface seal during the summer of 1999.

5. Evaluate effluent sampling methods to assure accurate determination of effluent rates and prediction of cleanup times

## REFERENCES


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# APPENDIX A

# PRESTARTUP PERIMETER SOIL BORINGS BOREHOLE LOGS AND HEADSPACE SCREENING

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-1* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started: 8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *17* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *17* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *7* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | Geo-probe Macro-sampler is 4ft in length |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-0.33ft: **Asphalt** | 1 | Macro-sampler | 0 | 0-2ft: Refusal with geo-probe sampler, relocate approx. 2ft west. |
| | 0.33-4ft: **Fill - Sandy Gravel:** *(GM)*, White (N9) to dk gry (N3), fine to v coarse, unconsld, poorly sorted, subang to subrd. | | | | |
| 5 | 4-7ft: **Fill - Sandy Gravel:** *(GM)*, As above. | 2 | Macro-sampler | 0 | 0-2ft: Refusal with geo-probe sampler, relocate approx. 2ft east of original location. |
| | 7-8ft: **Gravelly Silty Clay:** *(CL)*, Mod yel brn (10YR5/4) to mod brn (5YR3/4), V fine to fine, unconsld, poorly sorted, subang to subrd, wet. | | | | |
| 10 | 8-10.5ft: **Gravelly Silty Clay:** *(CL)*, As above. | 3 | Macro-sampler | 0 | Refusal at 10.5ft - no bdrk, relocate approx. 1ft north of borehole location. |
| | 10.5-12ft: **Gravelly Silty Clay:** *(CL)*, As above. | 4 | | 0 | |
| | 12-13ft: **Gravelly Silty Clay:** *(CL)*, As above. | 5 | Macro-sampler | 0 | |
| | 13-13.5ft: Gravell lens. | | | | |
| | 13.5-14ft: **Gravelly Clayey Silt:** *(ML)*, Mod yel | | | | |
| 15 | brn (10YR5/4) to Pale yel brn (10YR6/2), V fine to fine, semi-consld, poorly sorted, subang to subrd, moist. | | | | |
| | 14-16ft: **Gravelly Silty Clay:** *(CL)*, Mod yel brn (10YR5/4), V fine to fine, unconsld, poorly sorted, | 6 | Macro-sampler | 0 | |
| 20 | subang to subrd. | | | | |
| | 16-17ft: **Gravelly Silty Clay:** *(CL)*, As above, gravel fraction increase to 30%. | 7 | Macro-sampler | 0 | Sample collected for off-site Laboratory analysis. sample number:LO19123 |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-12 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started: 8/31/98 | Date Completed: 8/31/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 19 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 19 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-19ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 5-6 inches in diameter. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 8ft: Moist. | | | | |
| 10 | | | | | |
| 15 | 15-16ft: Cobble zone. | | | | |
| | 19ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-3* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *20* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *7.5* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-0.33ft: **Asphalt** | 1 | Macro-sampler | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| | 0.33-4ft: **Fill - Sandy Gravel:** *(GM)*, White (N9) to dk gry (N3), fine to v coarse, unconsld, poorly sorted, subang to subrd. | | | | |
| 5 | 4-7.5ft: **Fill - Sandy Gravel:** *(GM)*, As above. | 2 | Macro-sampler | 0 | |
| | 7.5-8ft: **Gravelly Clayey Silt:** *(ML)*, Olive gry (5Y4/1) to mod yel brn (10YR5/4), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. | | | | |
| 10 | 8-12ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 3 | Macro-sampler | 0 | |
| | 12-16ft: **Gravelly Clayey Silt:** *(ML)*, As above, at 15ft - gravel lense 8 inches thick, moist. | 4 | Macro-sampler | 0 | |
| 15 | | | | | |
| | 16-18ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 5 | Macro-sampler | 23 | Sample collected for off-site laboratory analysis |
| | 18-20ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 6 | Macro-sampler | 22 | Sample number:LO19124 |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-4* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started: 8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *17.5* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *8* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-4ft: **Gravelly Clayey Silt:** *(ML)*, Dk yel org (10YR6/6) to dk yel brn (10YR4/2), v fine to fine, unconsld, poorly sorted, subang to subrd. | 1 | Macro-sampler | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| 5 | 4-8ft: **Gravelly Clayey Silt:** *(ML)*, Mod brn (5YR4/4-3/4) to olive gry (5Y4/1), As above, gvl to 2 inches in dia., gvl frac 15-20%. | 2 | Macro-sampler | 0 | |
| | 8-10ft: **Gravelly Clayey Silt:** *(ML)*, Olive gry (5Y4/1) to lt olive gry (5Y6/1), As above, moist. | 3 | Macro-sampler | 0 | |
| 10 | 10-12ft: **Gravelly Clayey Silt:** *(ML)*, As above, 10.5-11.5ft - gravel lense., moist. | 4 | Macro-sampler | 0 | |
| | 12-14ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 5 | Macro-sampler | 0 | |
| 15 | 14-15.8ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 6 | Macro-sampler | 0 | |
| | 15.8-16ft: **Gravelly Silty Clay:** *(CL)*, Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, poorly sorted, unconsld, subang to subrd, moist. | | | | |
| 20 | 16-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. | 7 | Macro-sampler | 0 | Sample collected for off-site laboratory analysis. Sample number:LO19117 |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-5* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *16* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *5* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-4ft: **Gravelly Clayey Sandy Silt:** *(ML)*, Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to coarse, unconsld, poorly sorted, subang to subrd, moist, gvl frac 35+% and up to 2 inches in diameter. | 1 | Macro-sampler | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| 5 | 4-8ft: **Gravelly Clayey Silt:** *(ML)*, Lt brn (5YR5/6) to olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet at 5ft. | 2 | Macro-sampler | 0 | |
| 10 | 8-10ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 3 | Macro-sampler | 0 | |
| | 10-12ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 4 | Macro-sampler | 0 | |
| | 12-14ft: **Gravelly Clayey Silt:** *(ML)*, As above, at 13.5-14ft gvl lense, v moist. | 5 | Macro-sampler | 0 | |
| 15 | 14-16ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 6 | Macro-sampler | 0 | Sample collected for off-site laboratory analysis. Sample number:LO19116 |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-6* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started: 8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *16* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *6* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-4ft: **Gravelly Clayey Silt:** *(ML)*, Dk yel org (10YR6/6) to mod yel brn (10YR5/4) to lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | 1 | Macro-sampler | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| 5 | 4-8ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), as above, moist. | 2 | Macro-sampler | 0 | |
| | 8-10ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 3 | Macro-sampler | 0 | |
| 10 | 10-12ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 4 | Macro-sampler | 0 | |
| | 12-14.5ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 5 | Macro-sampler | 0 | |
| 15 | 14.5-16ft: **Gravelly Silty Clay:** *(CL)*, Olive gry (5Y4/1) to med gry (N5), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. | | | | Sample collected for off-site laboratory analysis. Sample number:LO19115 |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-7* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *12* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *TBD* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *4* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | Borehole flooded with muck - unable to reach bedrock. |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-4ft: **Gravelly Clayey Sandy Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsld, poorly sorted, subang to subrd, moist to wet - lower 4 inches. | 1 | Macro-samper | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| 5 | 4-8ft: **Gravelly Clayey Silt**: *(ML)*, Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet. | 2 | Macro-sampler | 0 | |
| | 8-9.5ft: **Gravelly Silty Clay:** *(CL)*, Olive gry (5Y4/1) to lt olive gry (5Y6/1), v fine to fine, | 3 | Macro-sampler | 0 | |
| 10 | unconsld, poorly sorted, subang to subrd, wet to saturated. | | | | |
| | 9.5-12ft: **Gravelly Silty Clay:** *(CL)*, As above, wet/saturated. | 4 | Macro-sampler | 0 | Sample collected for off-site laboratory analysis. Sample number:LO19114 |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-8* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/27/98* | *Date Completed: 8/27/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *16.1* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *16.1* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *7* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-4ft: **Gravelly Clayey Sandy Silt:** *(ML)*, Med yel brn (10YR5/4) to lt olive gry (5Y6/1) to olive gry (5Y4/1), fine to v fine, unconsld, poorly sorted, subang to subrd, moist. | 1 | Macro-sampler | 0 | The Geo-probe Macro-sampler is 4ft in length. |
| 5 | 4-8ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld subang to subrd, moist. | 2 | Macro-sampler | 0 | |
| | 8-12ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 3 | Macro-sampler | 0 | |
| 10 | | | | | |
| | 12-14ft: **Gravelly Clayey Silt:** *(ML)*, As above, moist. | 4 | Macro-sampler | 0 | Sample collected for off-site laboratory analysis. |
| | 14-16.1ft: **Gravelly Clayey Silt:** *(ML)*, As above. | 5 | Macro-sampler | 0 | Sample number:LO19114 |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-9* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/4/98* | *Date Completed: 9/4/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *16.5* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *16.5* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Bond* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete** | | | | The Geo-probe Macro-sampler is 4ft in length. |
| | 0.5-4ft: **Gravelly Sandy Clay:** *(CL)*, Mod olive brn (5Y4/4), gravels to 5cm angular edges, moderate cementation, clay content increases with depth, moist. | 1 | Macro-sampler | 0 | |
| 5 | 4-8ft: **Gravelly Sandy Clay:** *(CL)*, Olive gry (5Y4/1), moist, low plasticity, v slow dilatence, gravels to 2cm, gravels rounded, no oder. | 2 | Macro-sample | 0 | |
| | 8-12ft: **Gravelly Sandy Clay:** *(CL)*, Mod olive | 3 | Macro-sample | 0 | |
| 10 | brn (5Y4/4), as above. | | | | |
| | 12-14ft: **Gravelly Sandy Clay:** *(CL)*, As above. | 4 | Macro-sampler | 0 | |
| | 14-16ft: **Gravelly Sandy Clay:** *(CL)*, Mod olive | 5 | Macro-sampler | 0 | |
| 15 | brn (5Y4/4), as above. | | | | |
| | 16-16.5ft: **Gravelly Sandy Clay:** *(CL)*, As above. | 6 | Macro-sampler | 22 | Sample collected for off-site laboratory analysis: Sample number:LO19091 |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

PBH9bl.XLS

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PBH-10* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/4/98* | *Date Completed: 9/4/98* |
| *Driller: Patrick St. Peter and Sons* | *Total Depth (ft):* | *12.5* |
| *Equipment: Geoprobe* | *Depth to Bedrock (ft):* | *12.5* |
| *Drilling Method: Drive/Hammer* | *Hole Diameter (in):* | *2* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as Perimeter Borehole* | *Logged By: P. Bond* | |

| Depth (ft) | Description | Sample Number | Sample Type | Hnu Reading | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete** | | | | The Geo-probe Macro-sampler is 4ft in length. |
| | 0.5-4ft: **Gravelly Sandy Clay:** *(CL)*, Mod olive brn (5Y4/4), gravels to 4cm mostly angular edges, moist, clay content increases with depth, low plasticity, v slow dilatence. | 1 | Macro-sampler | 0 | |
| 5 | 4-8ft: **Gravelly Sandy Clay:** *(CL)*, Mod olive brn (5Y4/4) intermingled with lt olive gry (5Y5/2), moist, gravels 11cm rounded. | 2 | Macro-sampler | 0 | |
| | 8-12.5ft: **Gravelly Sandy Clay:** *(CL)*, As above, moist. | 3 | Macro-sampler | 0 | Sample collected for off-site laboratory analysis. Sample number:LO19053 and FD/LO19039 |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# H-Nu Survey

Borehole: JEBSC11617 (PB-1) Storage Temp ~ °F

Date: 8·27·96

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| 14-16 | 0 | | |
| 16-17 ← MPLE | 0 | 17 | LC19123 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Technician: P. ROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: JEBS021820 (PB-2) Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| 14-16 | 0 | | |
| 16-18 | 0 | | |
| SAMPLE → 18-20 | 0 | 28 | L019119 |
| | | | |
| | | | |
| | | | |
| | | | |

Technician: PROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: JEBS031618 (PB-3) Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| 14-16 | 0 | | |
| 16-18 | 13 | 23 | L019124 |
| 18-20 | 6 | 22 | |
| | | | |
| | | | |
| | | | |
| | | | |

Technician: PROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: JEBSO41617 (PB-4 Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| 14-16 | 0 | | |
| AMPLE → 16-17.5 | 0 | 27 | L019117 |
| | | | |
| | | | |
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| | | | |
| | | | |

Technician: P. ROSSIGNOL/G BERUBE

# H-Nu Survey

Borehole: JEBS051416 (PB-5) Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| E → 14-16 | 0 | 15 | L019116 |
| | | | |
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Technician: P. ROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: JEBS061416 (PB-6) Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) | |
|---|---|---|---|
| 0-2 | 0 | | |
| 2-4 | 0 | | |
| 4-6 | 0 | | |
| 6-8 | 0 | | |
| 8-10 | 0 | | |
| 10-12 | 0 | | |
| 12-14 | 0 | | |
| SAMPLE → 14-16 | 0 | 6 | L019115 |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |

Technician: P. ROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: JEBSO71012 (PB-7) Storage Temp ~ °F

Date: 8 27 98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) |
|---|---|---|
| 0-2 | 0 | |
| 2-4 | 0 | |
| 4-6 | 0 | |
| 6-8 | 0 | |
| 8-10 | 0 | |
| 10-12 | 0 | 29 L019114 |
| | | |
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Technician: P. ROSSIGNOL / G BERUBE

# H-Nu Survey

Borehole: JEBS081214 (PB-8) Storage Temp ~ °F

Date: 8.27.98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) |
|---|---|---|
| 0-2 | 0 | |
| 2-4 | 0 | |
| 4-6 | 0 | |
| 6-8 | 0 | |
| 8-10 | 0 | |
| 10-12 | 0 | |
| 12-14 | 0 | 25 L019112 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Technician: P. ROSSIGNOL / G. BERUBE

# H-Nu Survey

Borehole: PBH-09/JEBS09(PB-9) Storage Temp ~ °F

Date: 9-4-98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) |
|---|---|---|
| 0-2 | 0 | |
| 2-4 | 0 | |
| 4-6 | 0 | |
| 6-8 | 0 | |
| 8-10 | 0 | |
| 10-12 | 0 | |
| 12-14 | 0 | |
| 14-16 | 20 | 22 2019091 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Technician: _____

# H-Nu Survey

Borehole: JEBS10 (PB-10) Storage Temp ~ °F

Date: 9-4-98

| Depth (ft) | PID Scan Reading (ppm) | PID Headspace Reading (ppm) |
|---|---|---|
| 0-2 | 0 | |
| 2-4 | 0 | |
| 4-6 | 0 | |
| 6-8 | 0 | |
| 8-10 | 0 | |
| 10-12 | 0 | |
| 12-14 (12.5 PB empty) | 0 | 18 L01905 3<br>L019039 E |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

2nd attempt

Technician: _____

# APPENDIX B

# AIR EXTRACTION WELL, PASSIVE AIR VENT, MONITORING POINT BORING LOGS AND WELL CONSTRUCTION LOGS

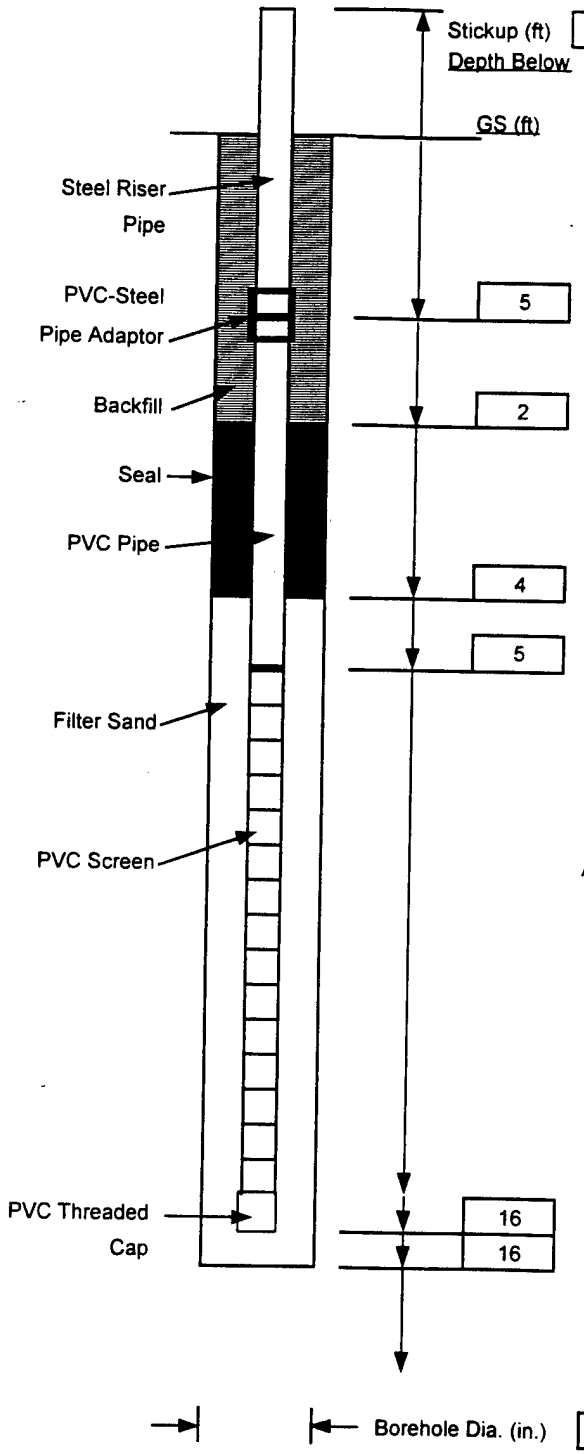
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-1* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *12* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-16ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 8ft: Moist. | | | | |
| 10 | | | | | |
| | 12ft: Wet to soupy. | | | | |
| 15 | | | | | |
| | 16ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-1 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | 12 | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 200lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

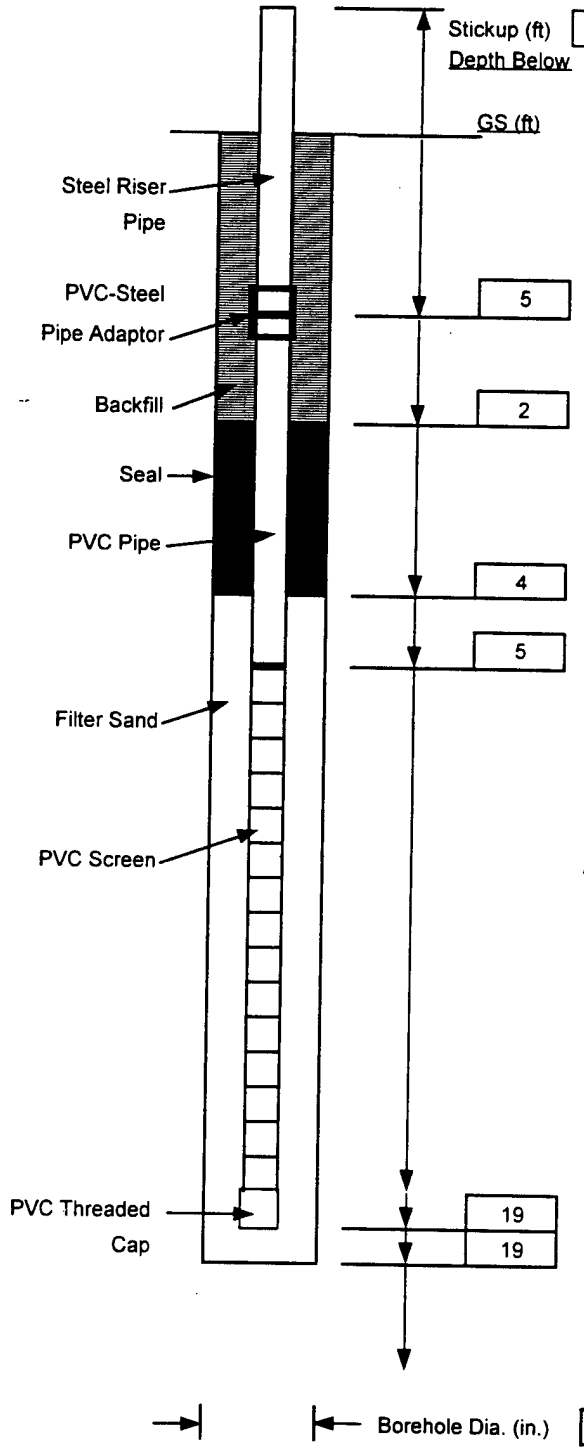
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-2* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-19ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation<br><br>Refusal at 5ft BGL, relocated approx. 6ft south of original location to continue advancement. |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| | 19ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-2 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 15 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

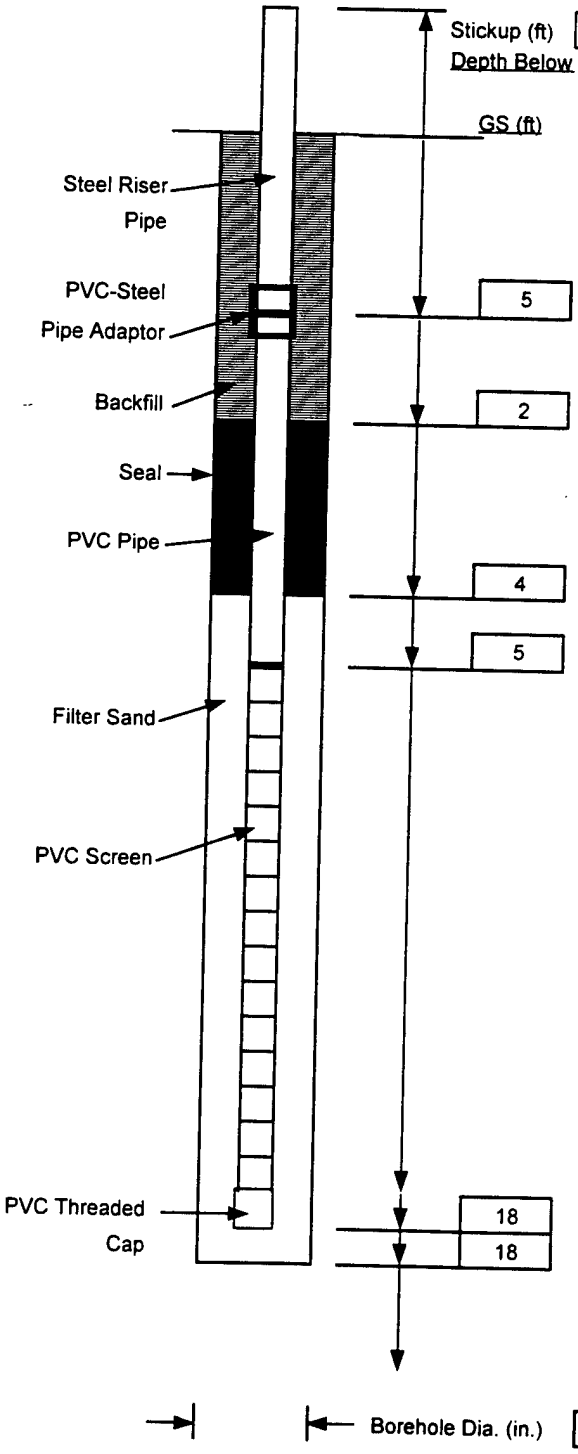
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-3* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-18ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation Refusal at 3ft BGL, (3x), 1st refusal relocated 3ft north of original location, 2nd refusal relocated 6ft east of original location, 3rd refusal relocated 6ft north of original location. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 18ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-3 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

Type: Schedule 40 Steel
Diameter (in.): 2
Length (ft): 6

**Riser Pipe 2**

Type: Schedule 40 PVC
Diameter (in.): 2
Length (ft): N/A

**Backfill**

Type: EZ mud/Benseal
Length (ft): 2
Placement: Pour

**Seal**

Type: Bentonite Pellets
Length (ft): 2
Placement: Pour

**Filter Pack**

Type: 10-20 Silica Sand
Length (ft): 14
Placement: Pour
Amount Placed: 275lbs

**Screen**

Type: Schedule 40 PVC
Length (ft): 13
Diameter (in.): 2
Slot Size (in.): 0.010
Slot Type: Machine Slotted

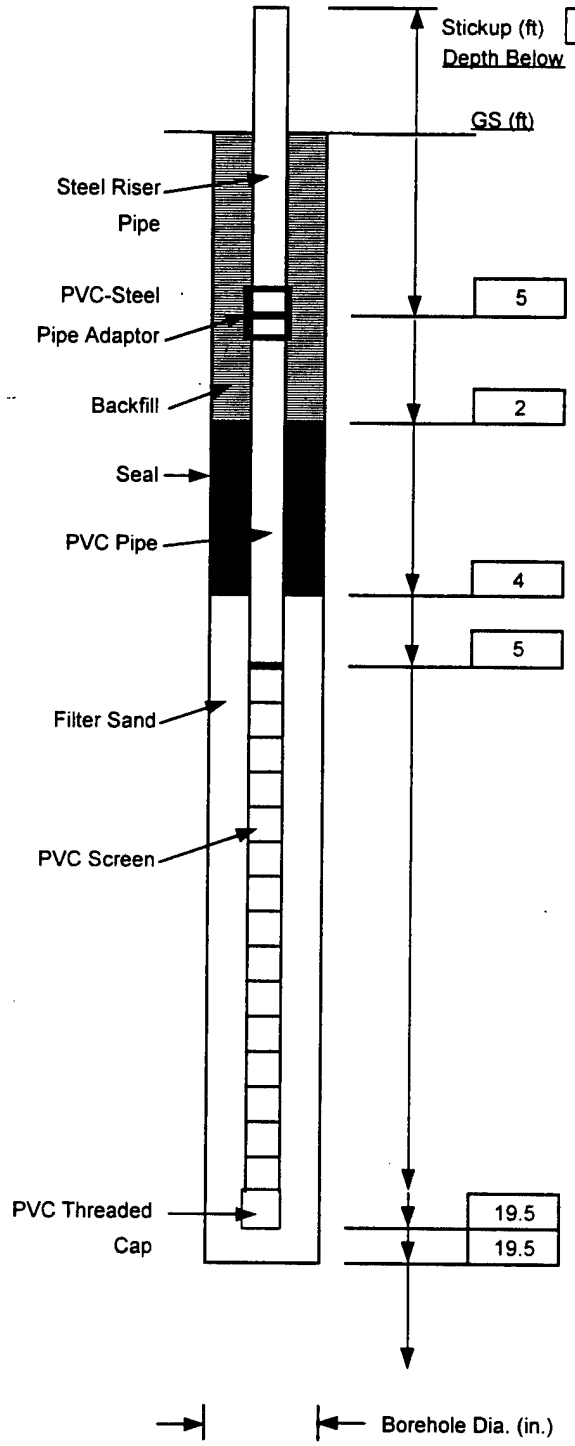
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-4* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-19.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation<br><br>Refusal at 5ft BGL, relocated approx. 4ft east of original location. |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 19.5ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-4 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 15.5 |
| Placement | Pour |
| Amount Placed | 300lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

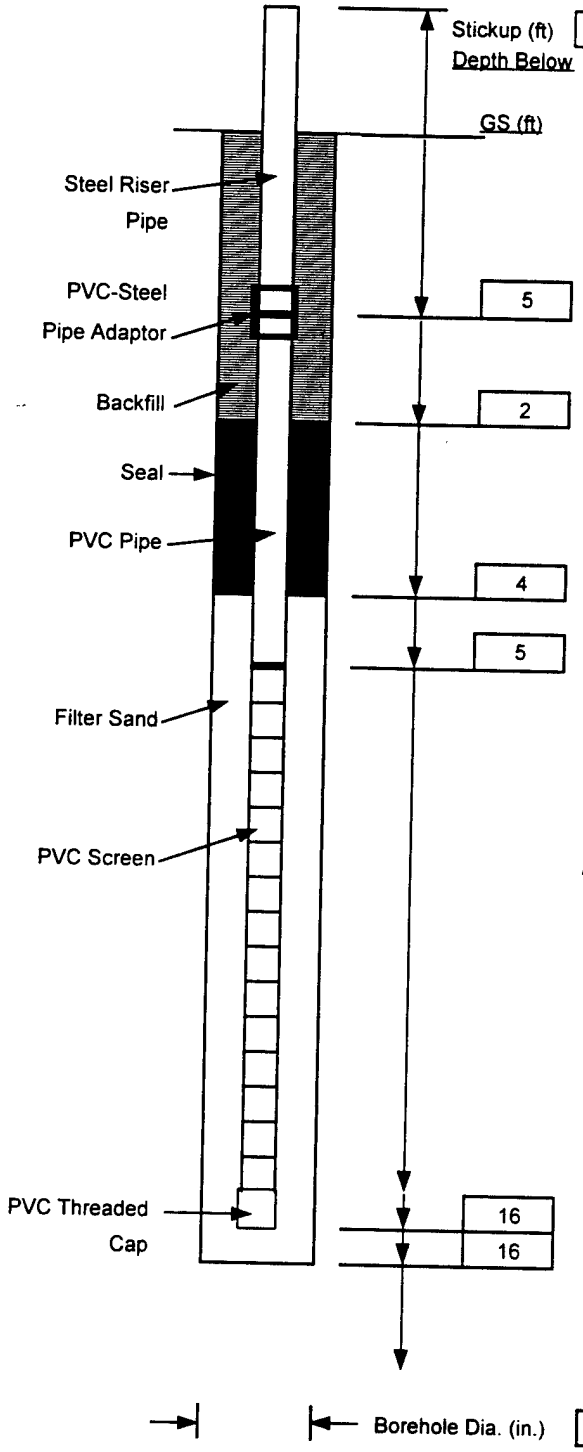
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-5* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-16ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.<br><br>16ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-5 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 200lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

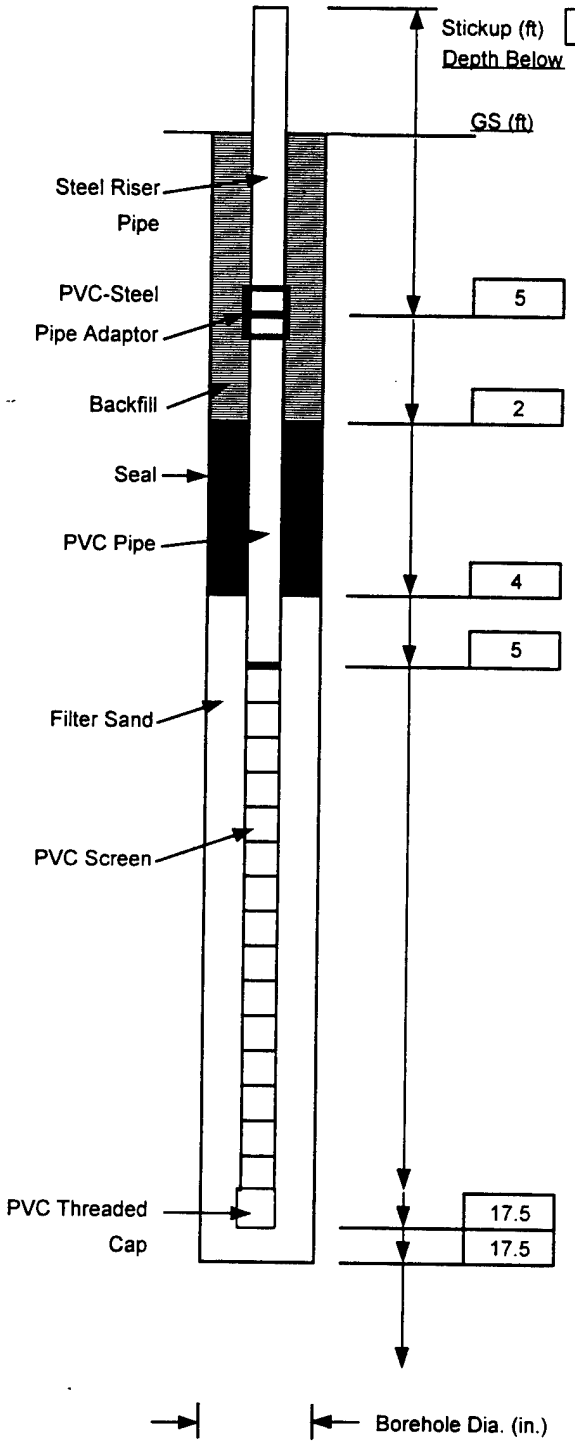
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-6* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 17.5ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-6 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13.5 |
| Placement | Pour |
| Amount Placed | 250lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

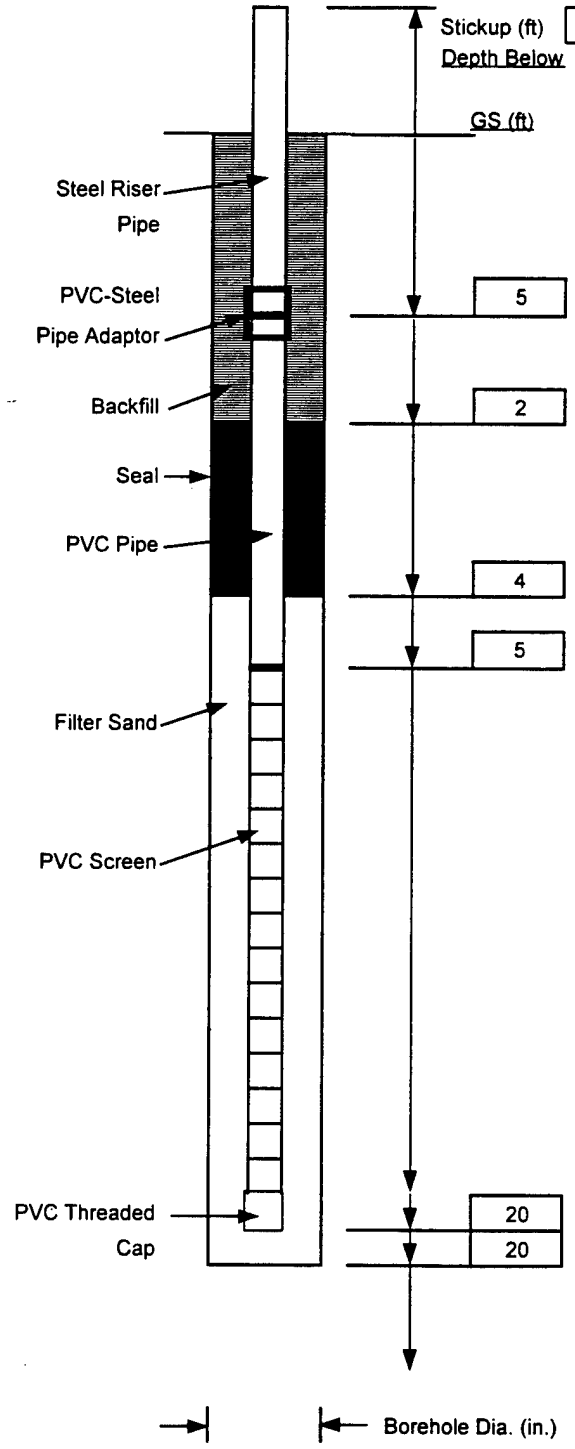
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-7* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd. | | | | No samples required to be collected during installation |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| Loring AFB | Site: JEBS | | Well No.: AEW-7 |
|---|---|---|---|
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 325lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

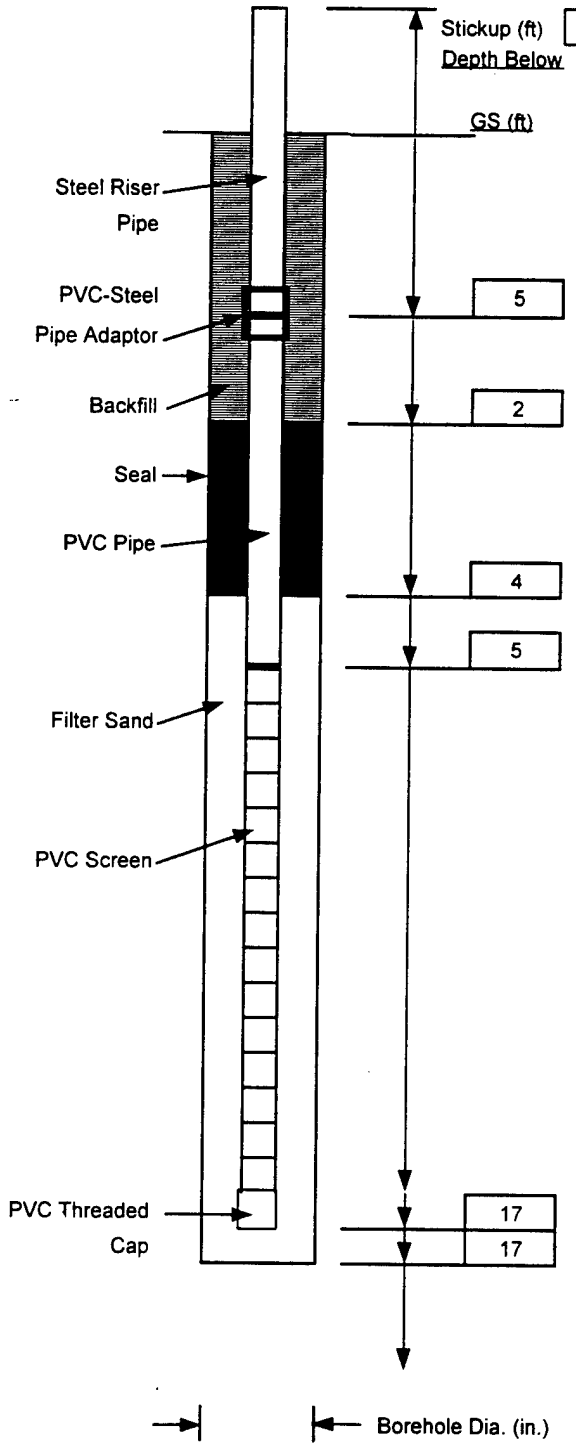
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-8* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-17ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-6 inches in diameter.<br><br>17ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-8 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

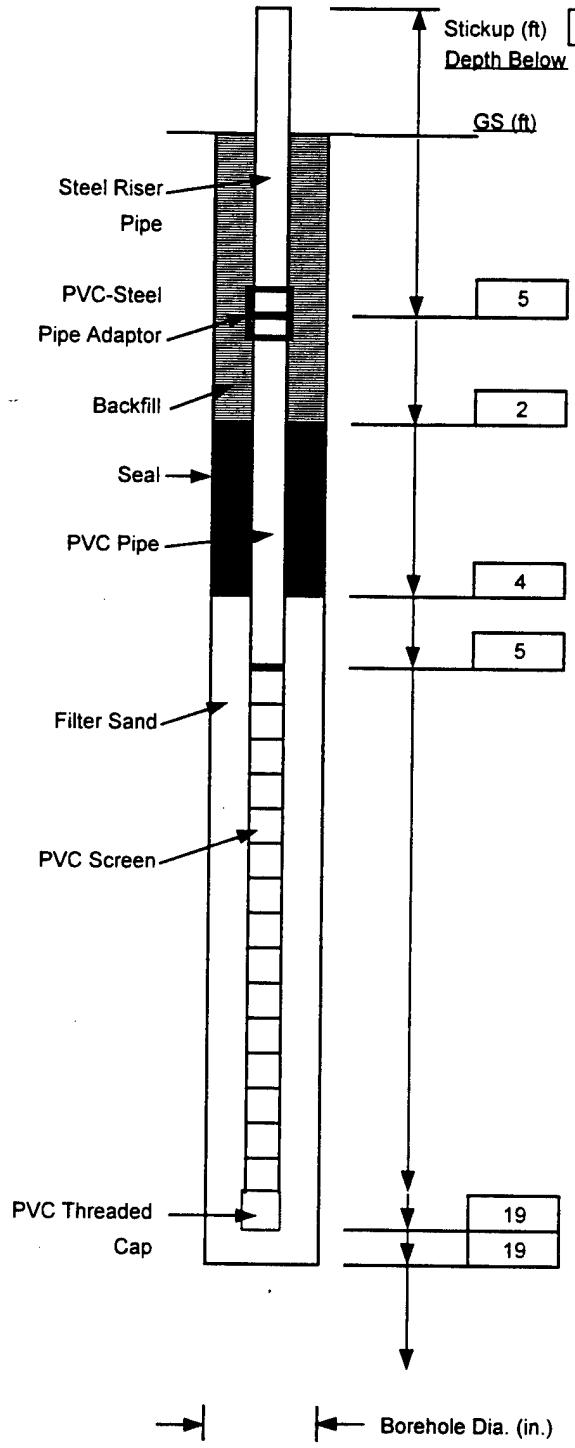
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-9* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-19ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 19ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-9 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 20 |
| Placement | Pour |
| Amount Placed | 325lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

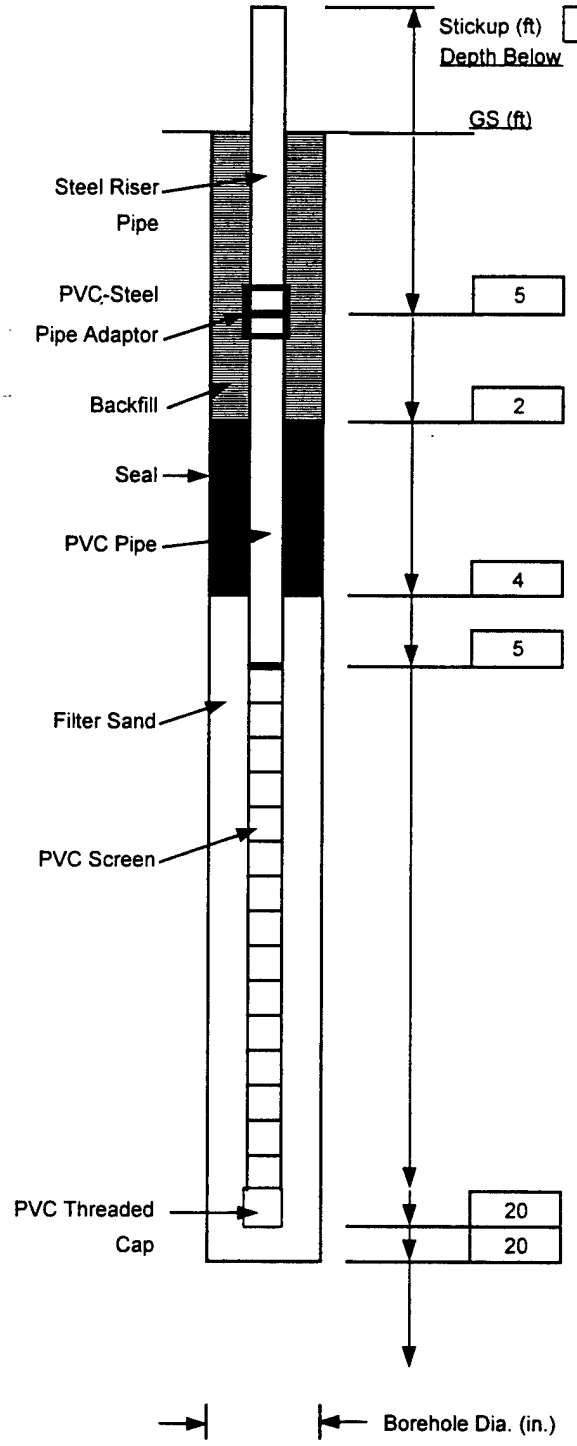
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-10* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-10 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 350lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

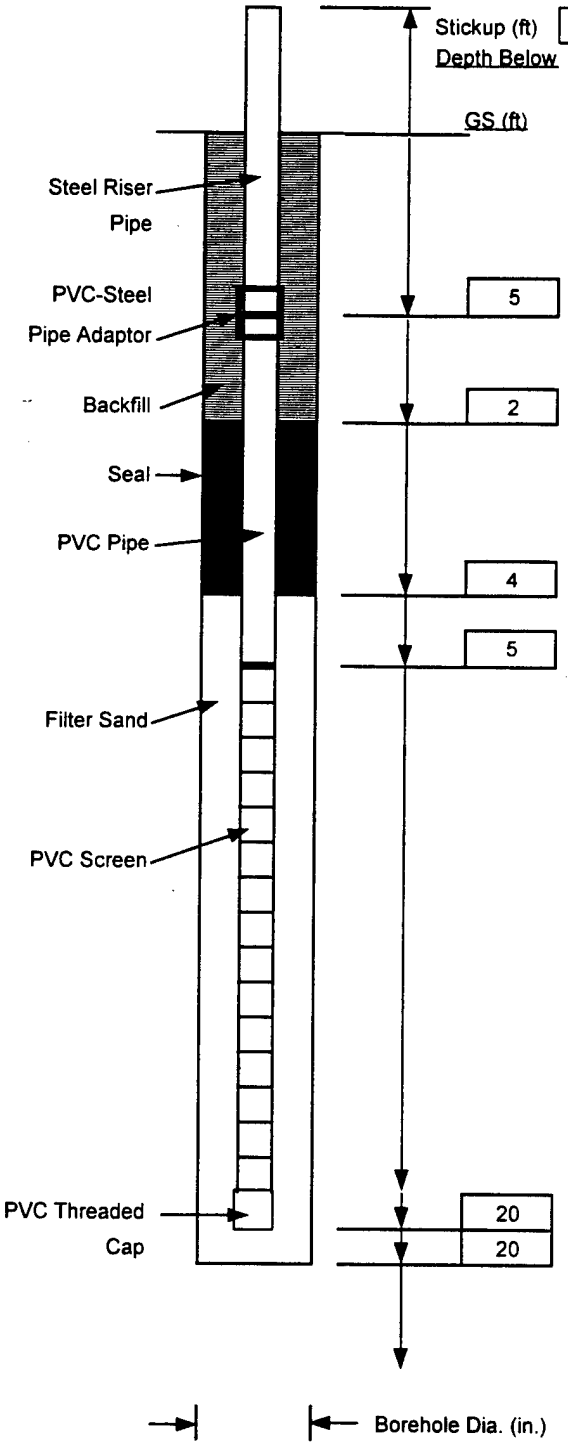
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-11* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 3 inches in diameter, moist. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-11 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 400lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

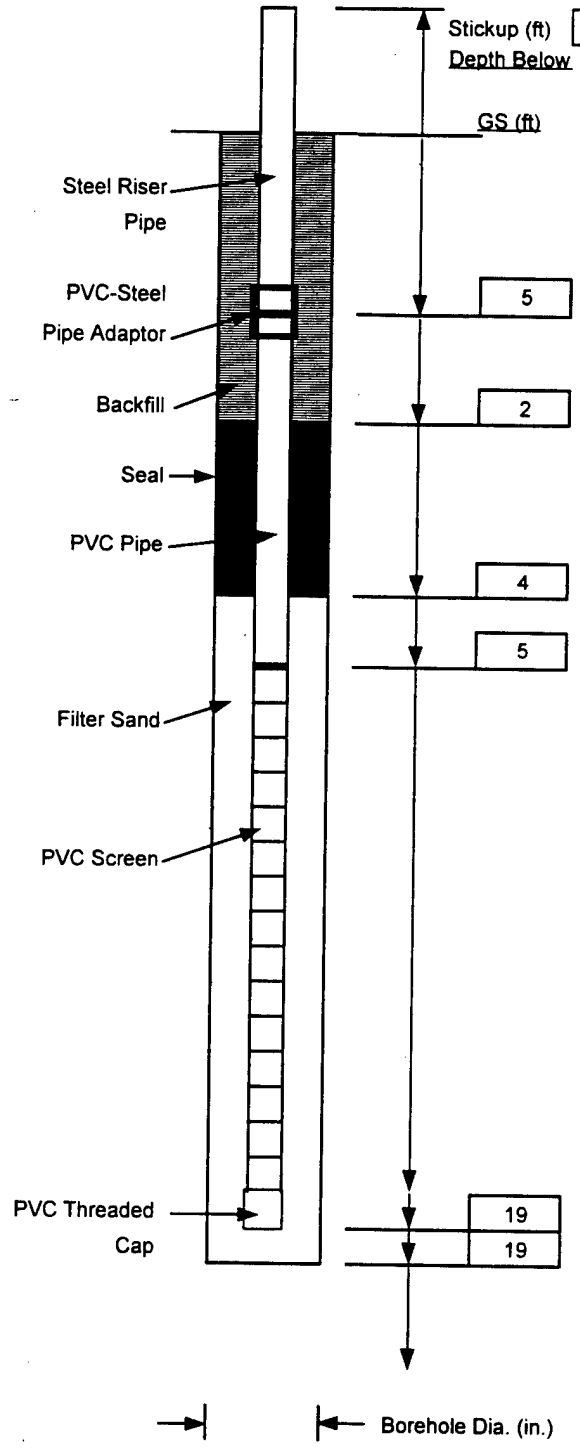
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-12* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-19ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 5-6 inches in diameter. | | | | No samples required to be collected during installation |
| 10 | 8ft: Moist. | | | | |
| 15 | 15-16ft: Cobble zone. | | | | |
| 20 | 19ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-12 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 15 |
| Placement | Pour |
| Amount Placed | 300lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-13* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started: 8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-18ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 9ft: Moist. | | | | |
| 10 | 11ft: V moist. | | | | |
| 15 | 15ft: Moist. | | | | |
| | 18ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-25* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *12* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *12* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-12ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 6 inches in diameter.<br>5-5.5ft: Cobble zone. | | | | No samples required to be collected during installation |
| 10 | 12ft: **Bedrock:** Limestone. | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

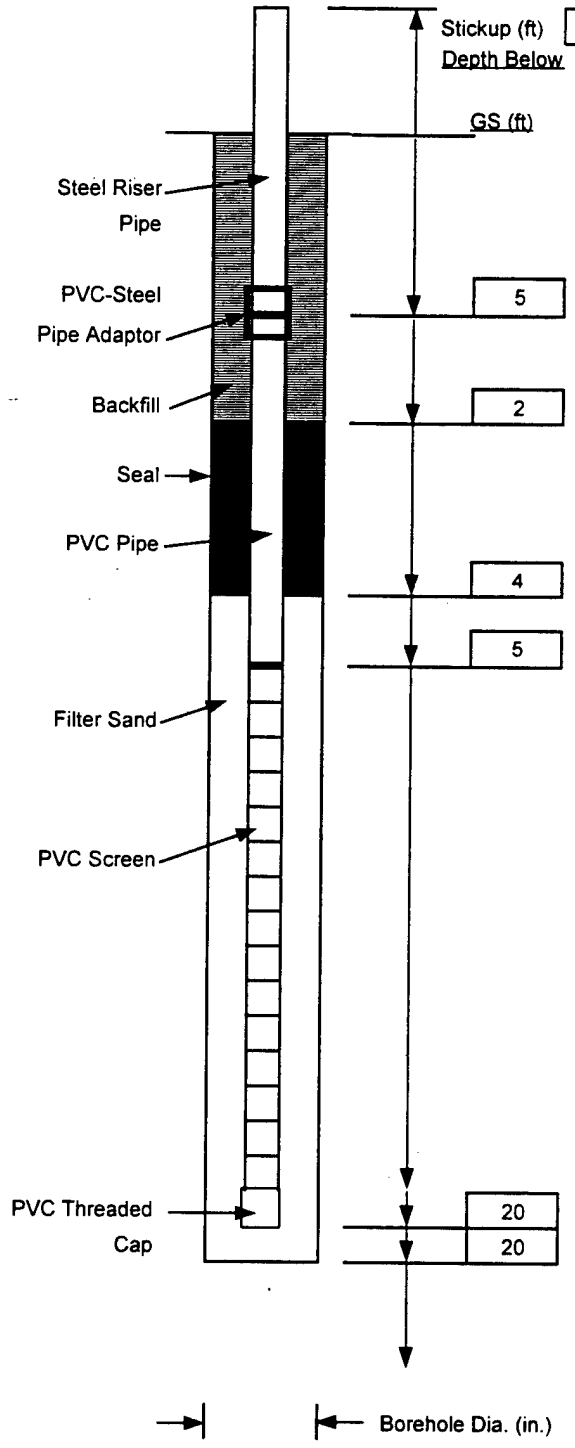
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-14 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started: 8/31/98 | Date Completed: 8/31/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 20 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 20 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 5 inches in diameter. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 19ft: V moist.<br>20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-14 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 400lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

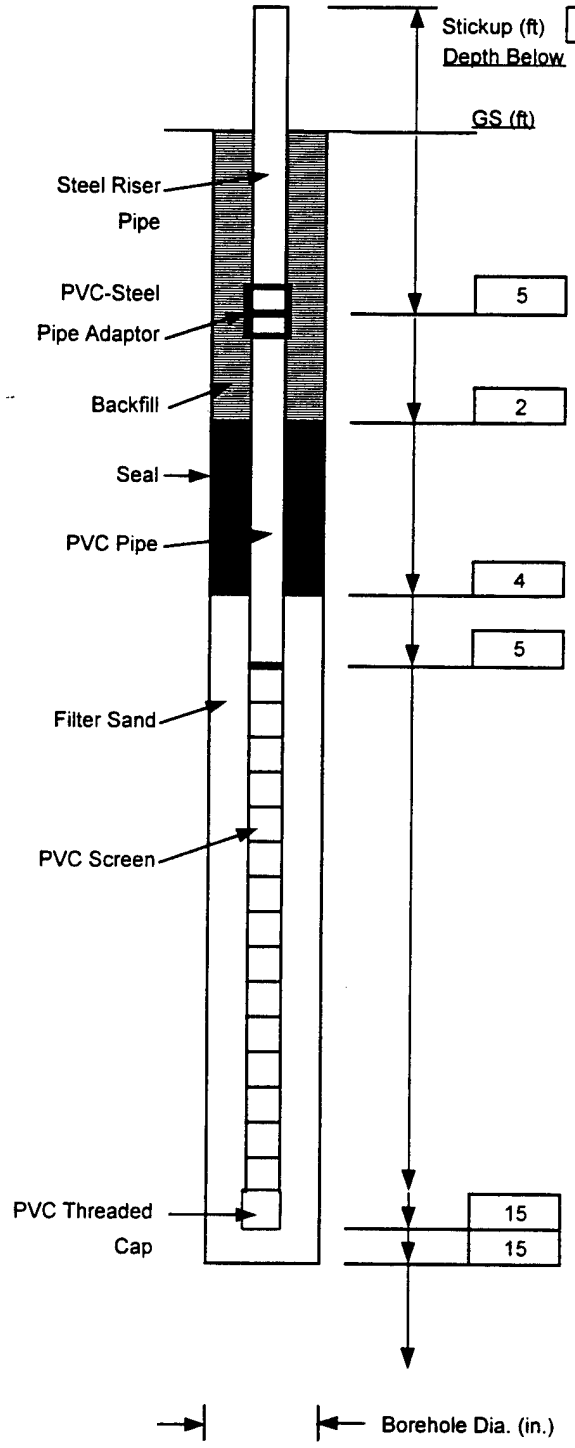
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-15* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started: 8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-15ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 6 inches in diameter. | | | | No samples required to be collected during installation |
| 5 | 5-7ft: Cobble zone. | | | | |
| 15 | 15ft: **Bedrock:** Limestone. | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| Loring AFB | Site: JEBS | | Well No.: AEW-15 |
|---|---|---|---|
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11 |
| Placement | Pour |
| Amount Placed | 225lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

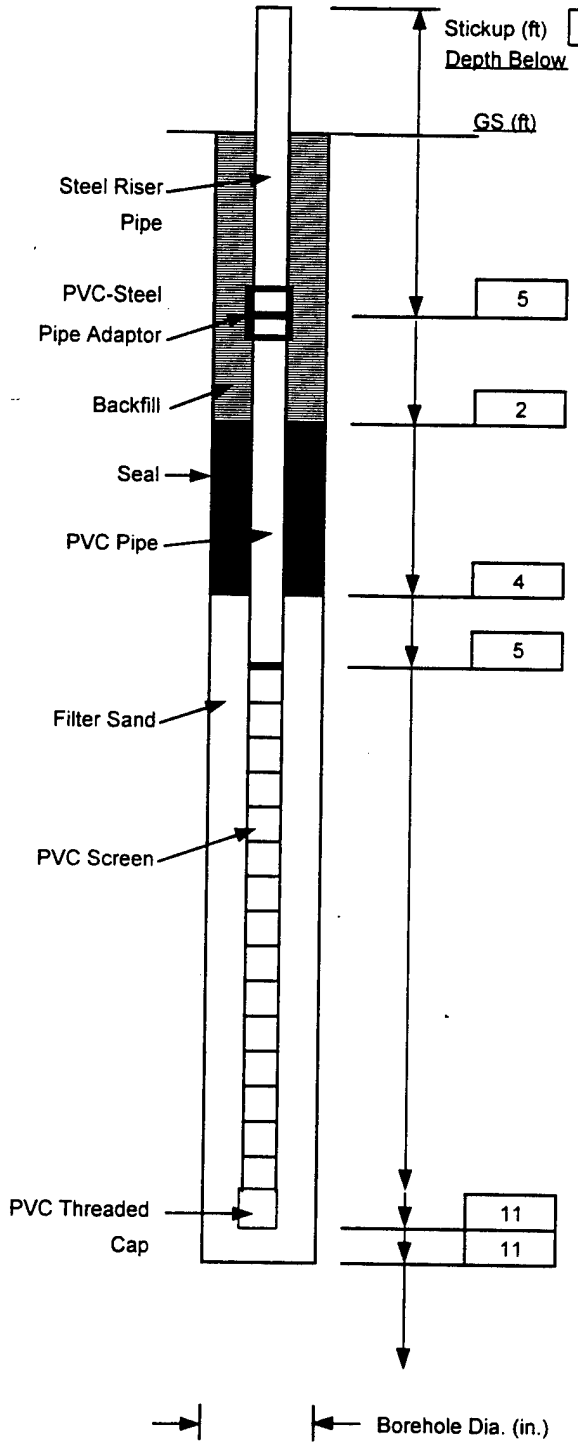
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-16 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started: 8/31/98 | Date Completed: 8/31/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 11 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 11 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-11ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 3-4 inches in diameter. | | | | No samples required to be collected during installation |
| 10 | 11ft: **Bedrock:** Limestone. | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-16 |
| Q | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 7 |
| Placement | Pour |
| Amount Placed | 175lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 6 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

Borehole Dia. (in.) 8

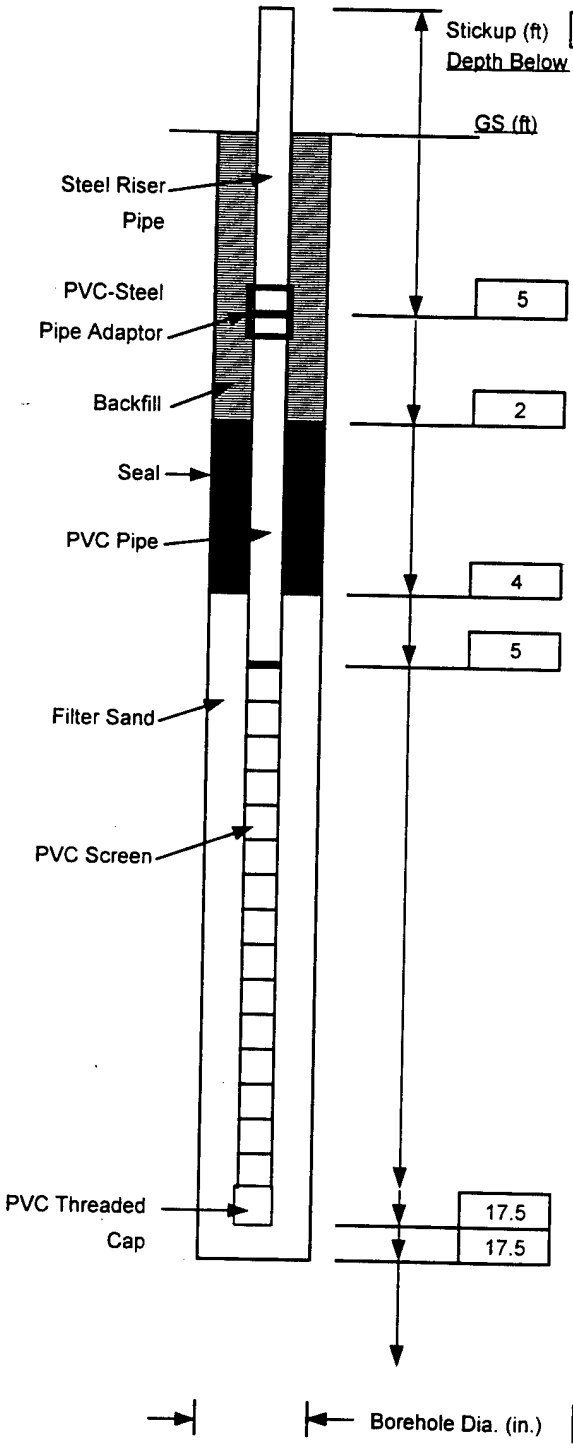
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-17* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-0.25ft:**Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 17.5ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-17 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13.5 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

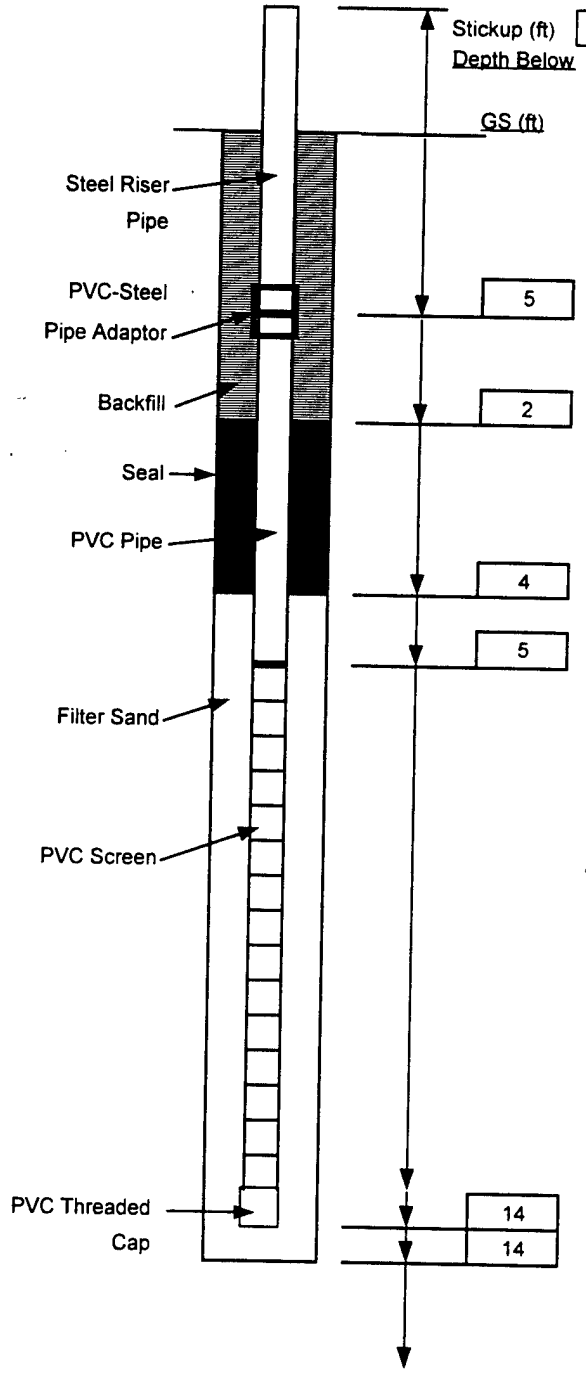
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-18* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *14* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *14* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-14ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter. | | | | No samples required to be collected during installation |
| 5 | 6ft: Moist. | | | | |
| 10 | | | | | |
| 14 | 14ft: **Bedrock:** Limestone. | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-18 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 10 |
| Placement | Pour |
| Amount Placed | 175lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 9 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

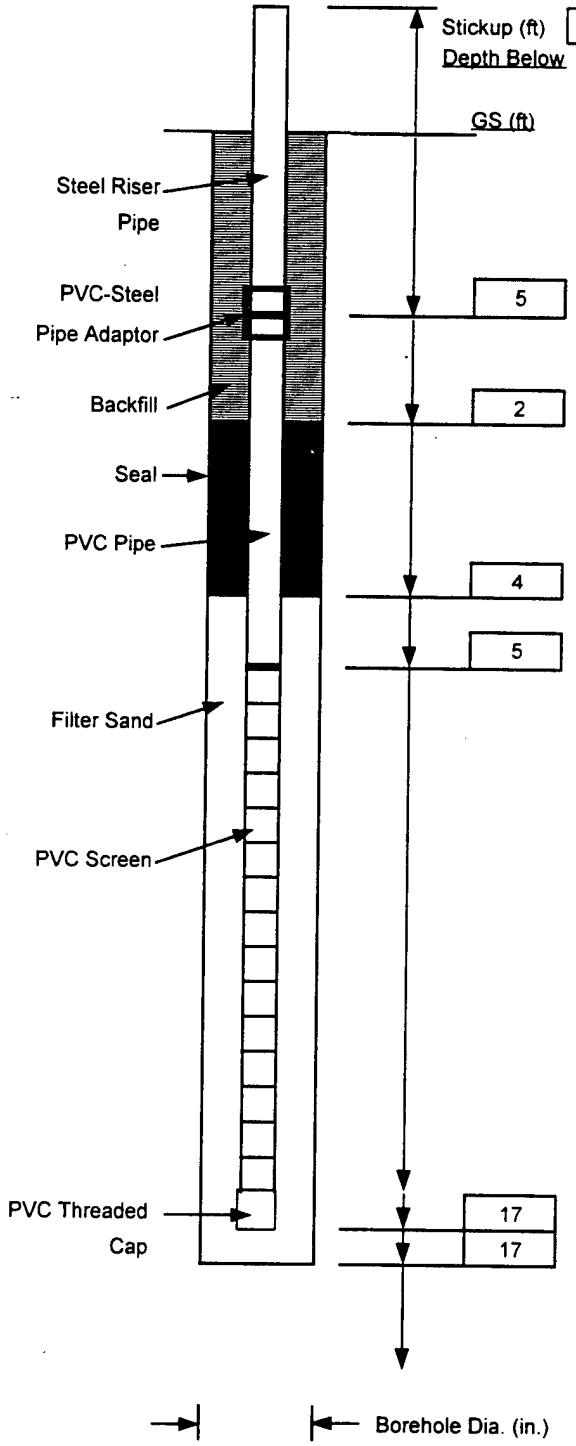
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-19* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-17ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter.<br><br>6-7ft: Cobble zone. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 17ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-19 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

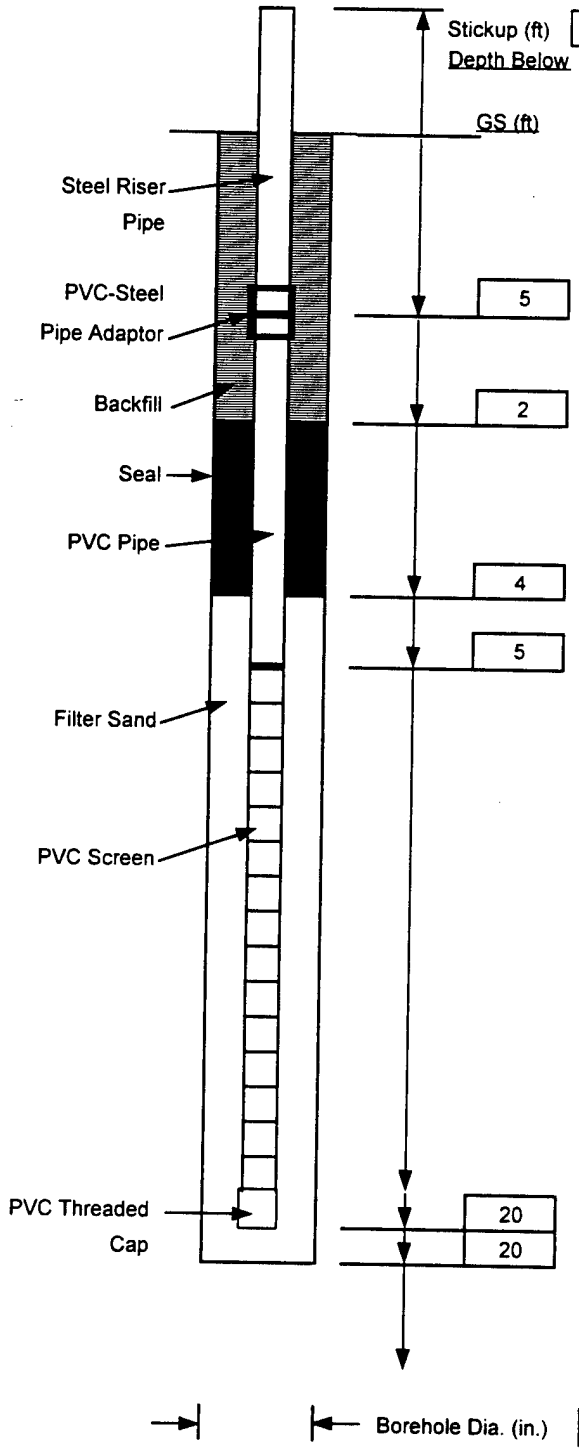
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-20 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started:9/1/98 | Date Completed: 9/1/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 20 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 20 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill - Gravel**<br>1-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | 7ft: Moist. | | | | |
| 10 | 10ft: Clay fraction increase to approx. 20%.<br>11ft: Clay fraction decrease to <10%.<br>12ft: V moist. | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-20 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 650lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

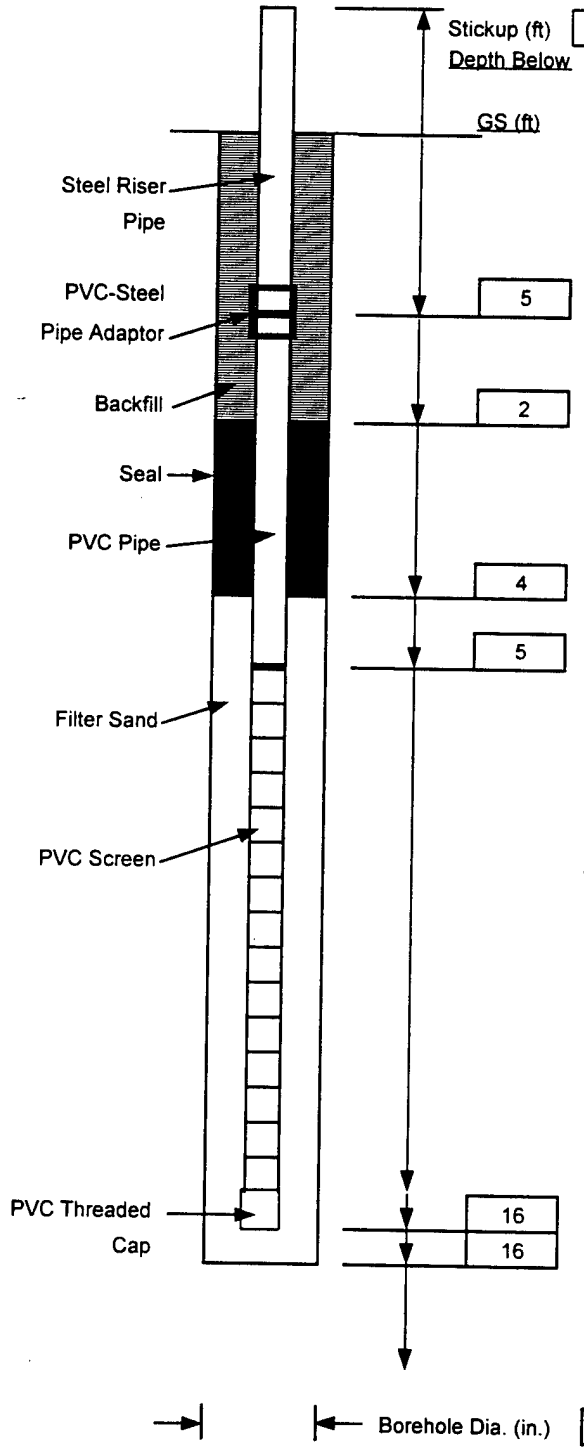
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-21* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *12* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill - Gravel**<br>1-8ft: **Clayey silty gravel:** *(GP)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to coarse, unconsld, poorly sorted, subang to subrd.<br><br>8-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld subang to subrd, v moist to wet, gvl 2-3 inches in diameter.<br>11-11.5ft: Cobble zone.<br>12ft: water, soupy cuttings.<br><br>16ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-21 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

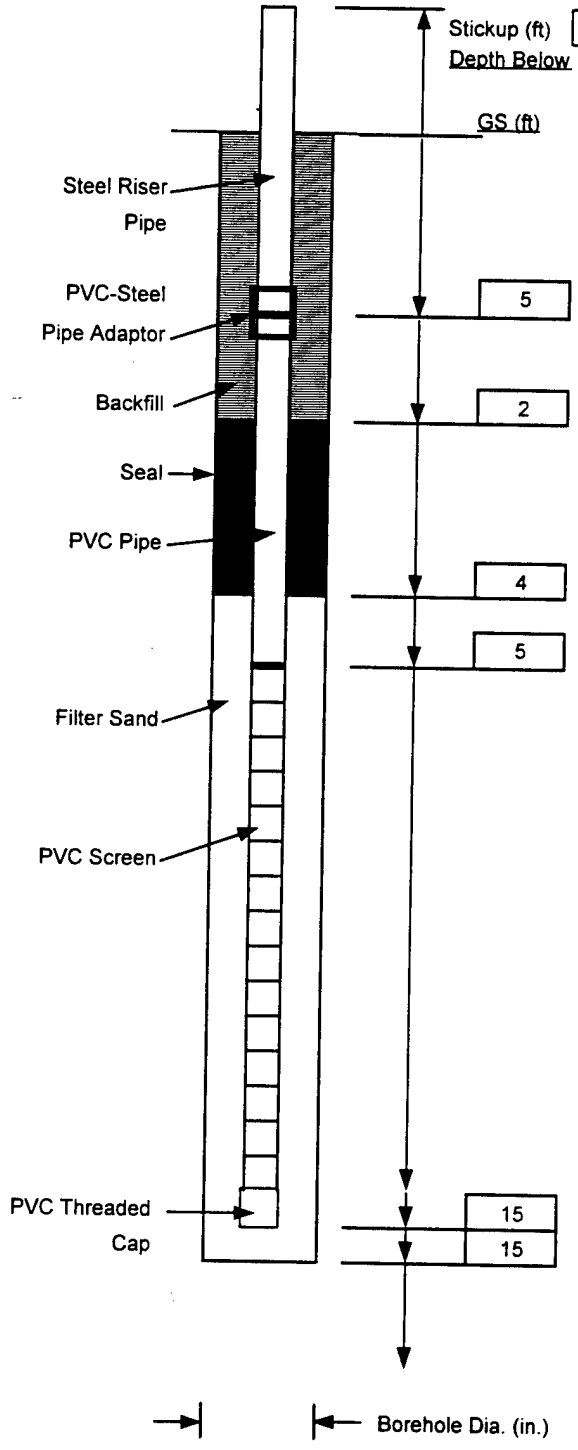
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-22* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-1ft: **Fill - Gravel**<br>1-15ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | 15ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-22 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11 |
| Placement | Pour |
| Amount Placed | 200lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

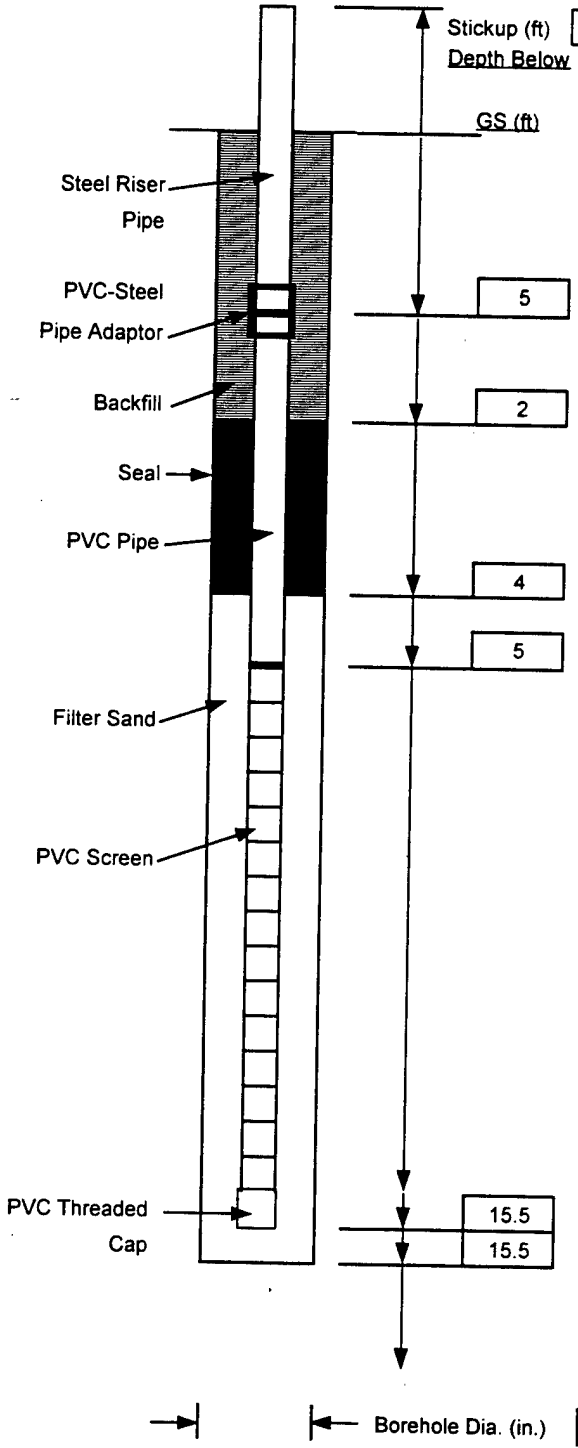
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-23* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-15.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | 15.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-23 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11.5 |
| Placement | Pour |
| Amount Placed | 250lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

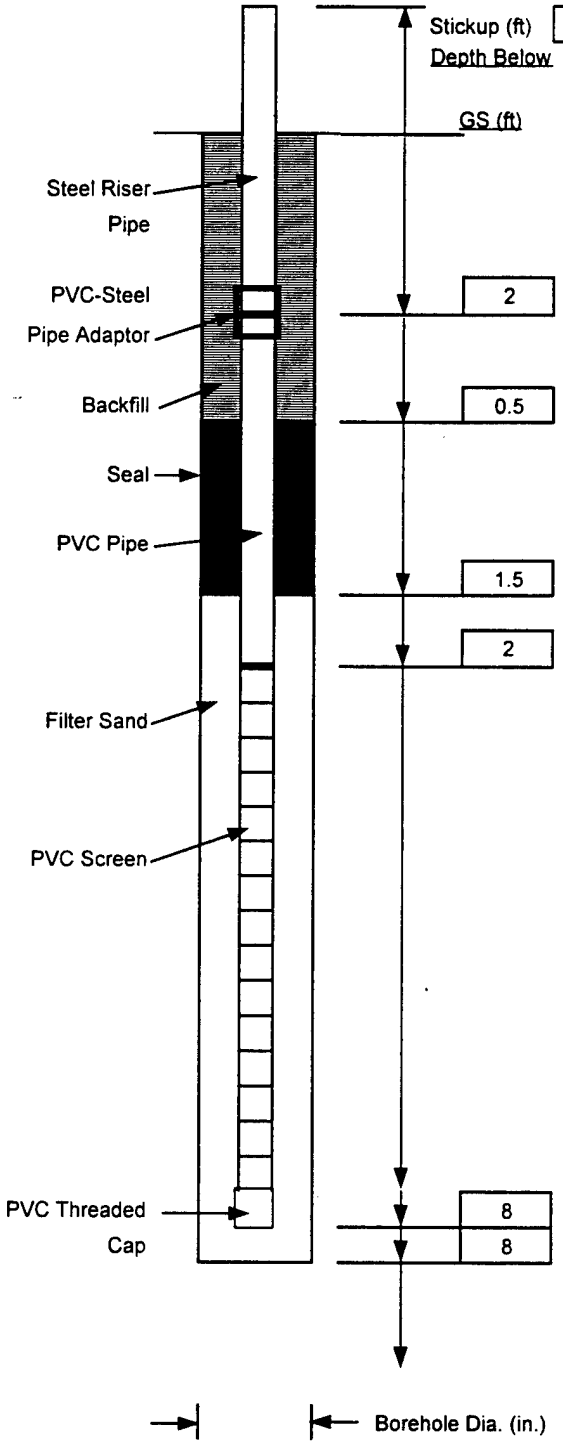
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-24* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *8* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *8* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-8ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 7ft: Cobble zone. | | | | |
| | 8ft: **Bedrock:** Limestone. | | | | Auger refusal at 7ft, relocated approximately 4ft west of oringinal location. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-24 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 3 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 0.5 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 1 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 6.5 |
| Placement | Pour |
| Amount Placed | 125lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 6 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

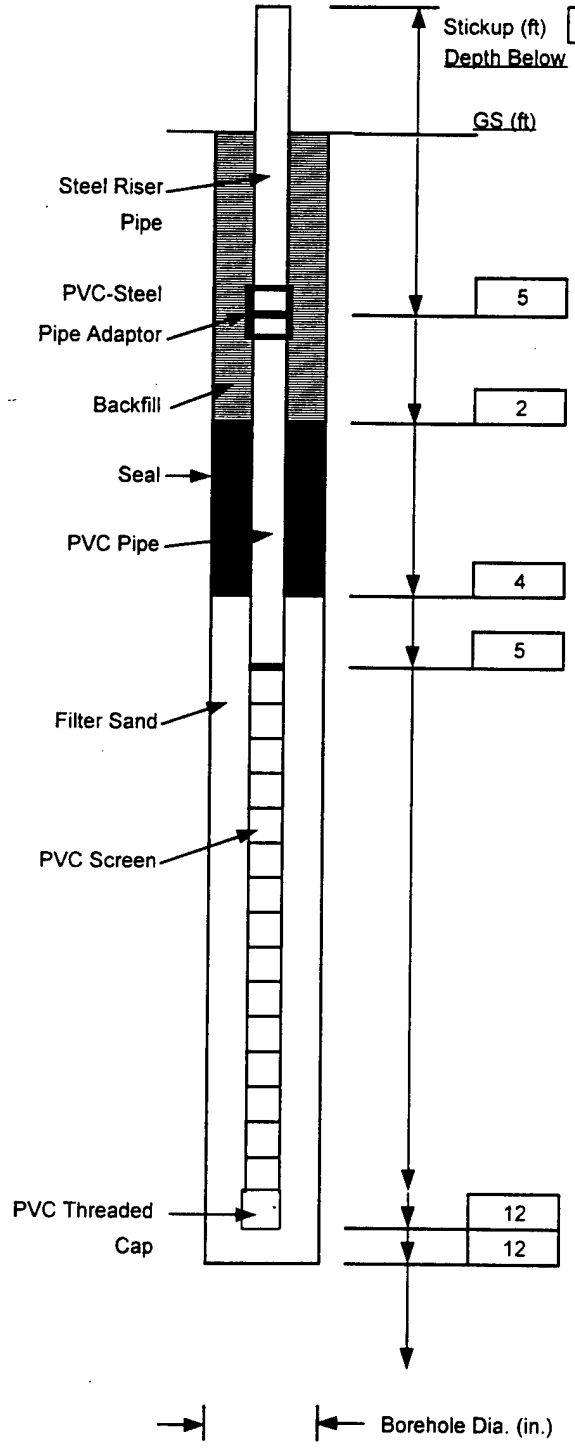
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-25* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *12* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *12* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-12ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl to 6 inches in diameter.<br>5-5.5ft: Cobble zone. | | | | No samples required to be collected during installation |
| 10 | 12ft: **Bedrock:** Limestone. | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-25 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 8 |
| Placement | Pour |
| Amount Placed | 162.5lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 7 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-26* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill - Gravel**<br>1-15ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br>15ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-39 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started:9/3/98 | Date Completed: 9/3/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 24 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 24 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-24ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | 24ft: **Bedrock:** Limestone. | | | | |
| 30 | | | | | |

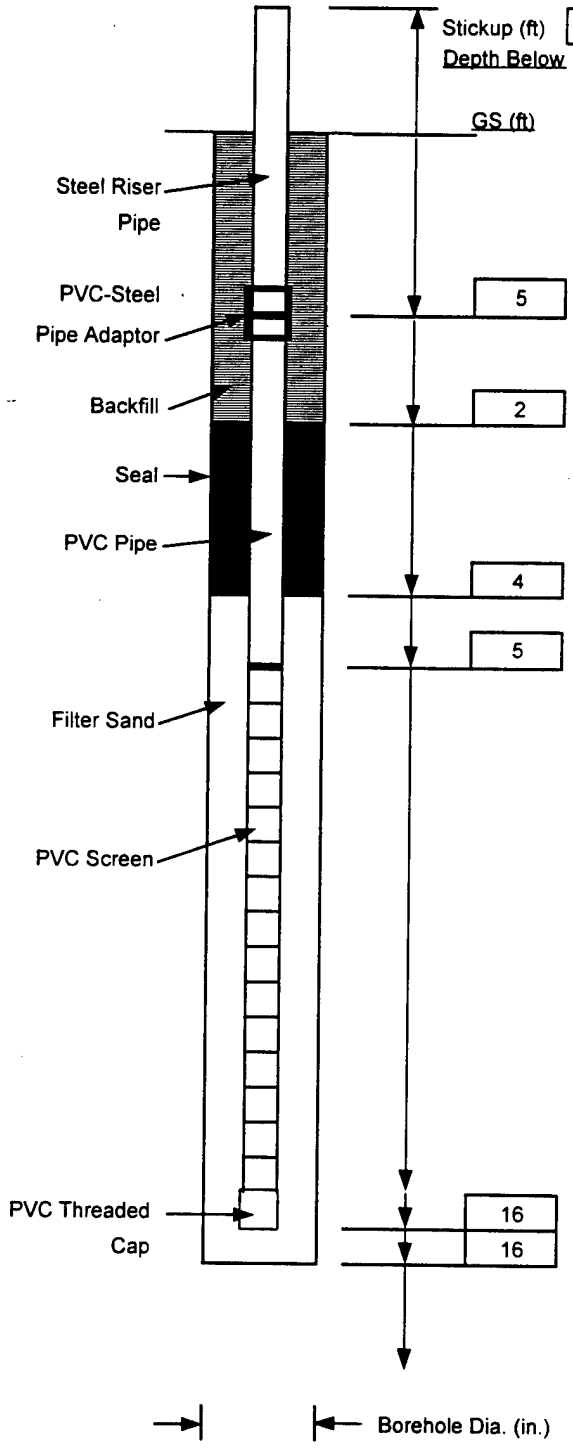
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-27* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.6ft: **Concrete**<br>0.6-8ft: **Fill - Gravel** | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 8-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | |
| 10 | | | | | |
| 15 | 16ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-27 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

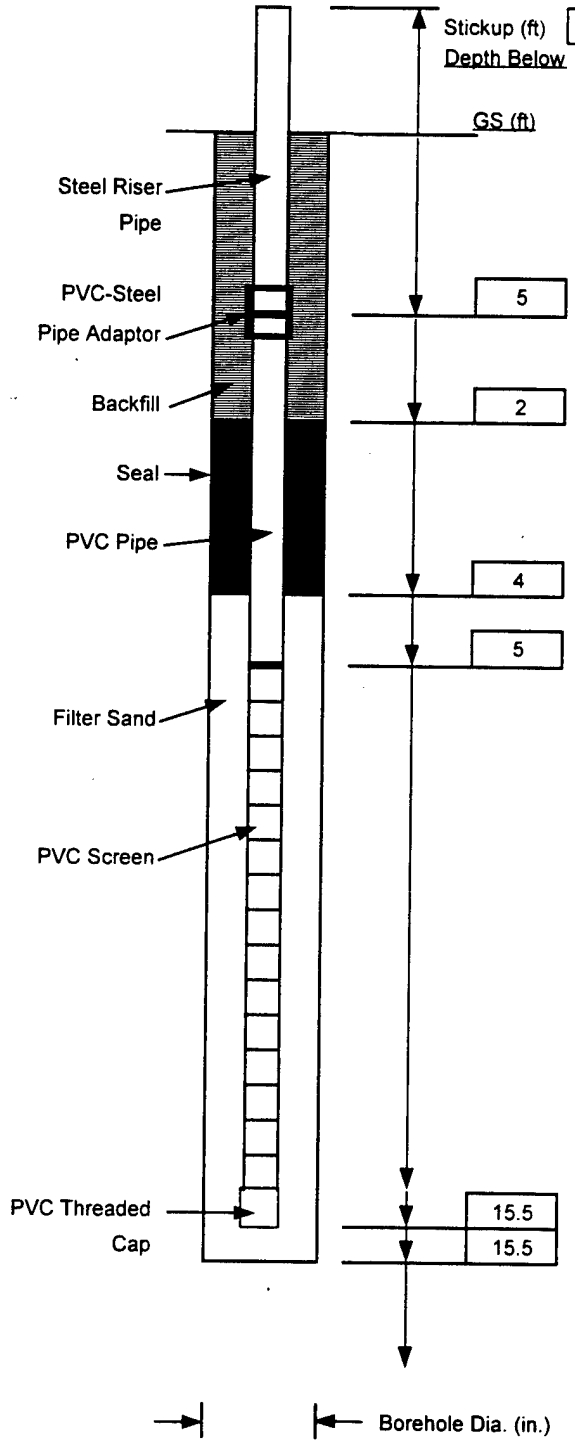
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-28* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-1: **Fill - Gravel**<br>1-15.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | 15.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-28 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11.5 |
| Placement | Pour |
| Amount Placed | 200lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

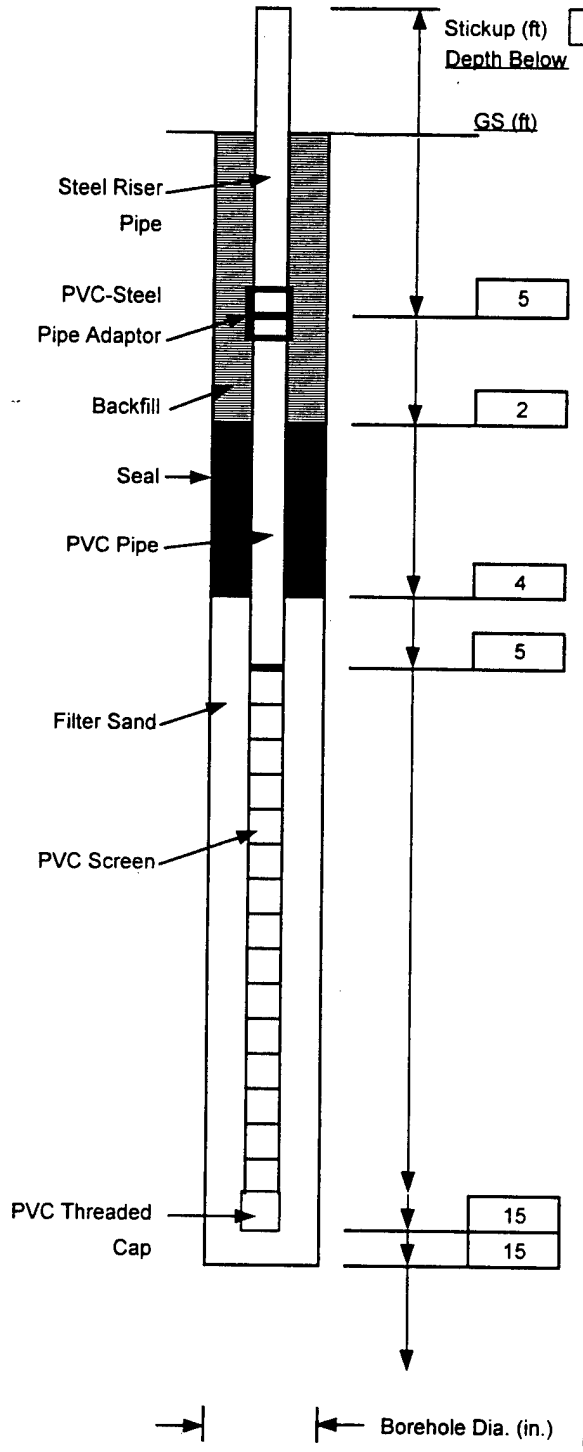
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-29* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/4/98* | *Date Completed: 9/4/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-1ft: **Concrete**<br>1-13ft: **Fill - Gravel** | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | 13-15ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br>15ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-29 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/4/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/4/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11 |
| Placement | Pour |
| Amount Placed | 175lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

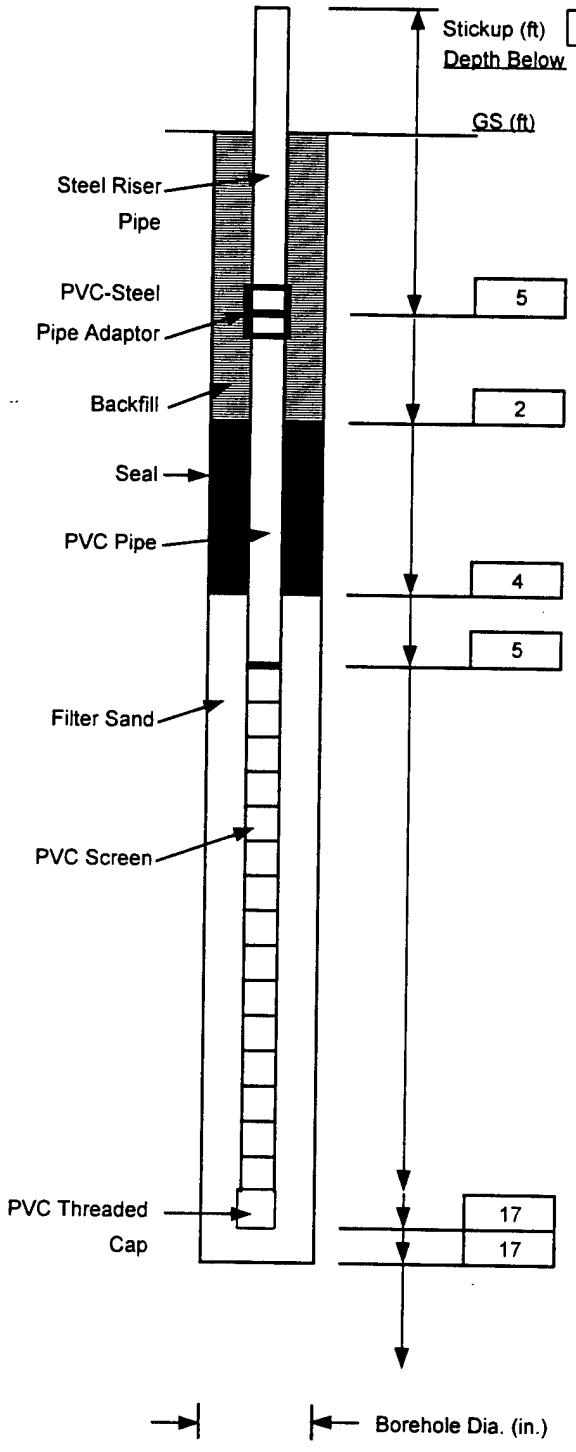
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-30 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started:9/4/98 | Date Completed: 9/4/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 17 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 17 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-1ft: **Concrete**<br>1-6ft: **Fill - Gravel** | | | | No samples required to be collected during installation |
| 5 | 6-17ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | |
| 10 | | | | | |
| 15 | 17ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-30 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/4/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/4/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13 |
| Placement | Pour |
| Amount Placed | 200lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

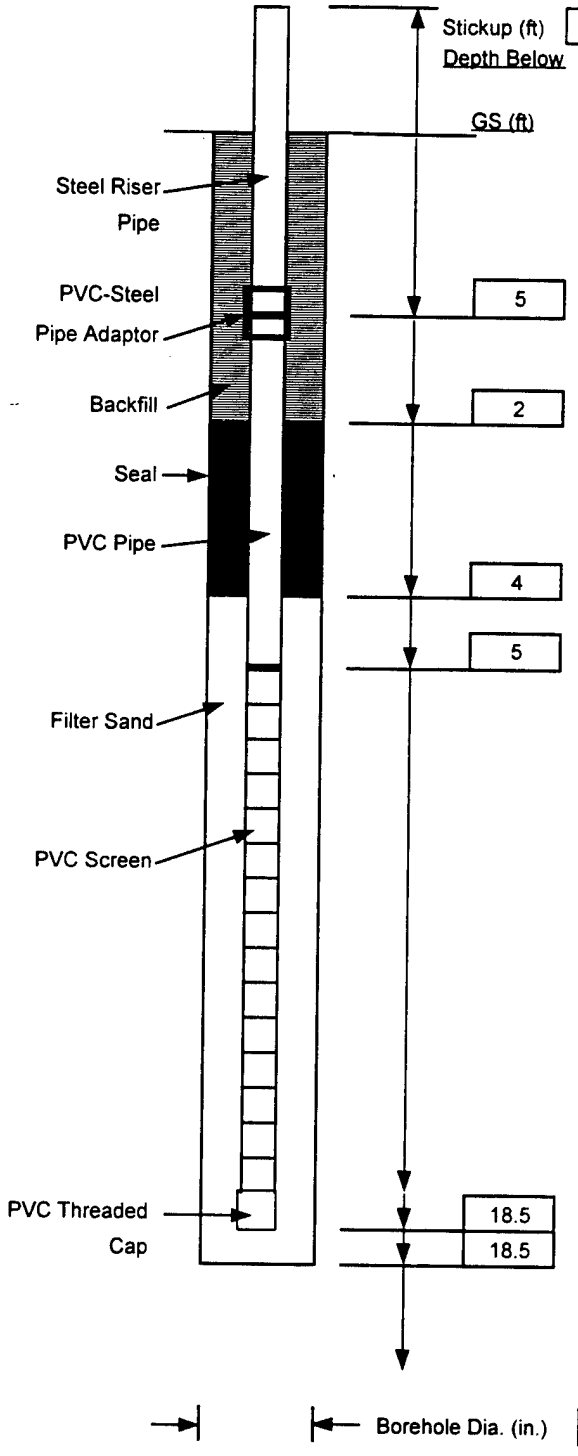
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-31* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-18.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation Relocated approximately 10ft east of original location to allow for rig access. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 18.5ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-31 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14.5 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

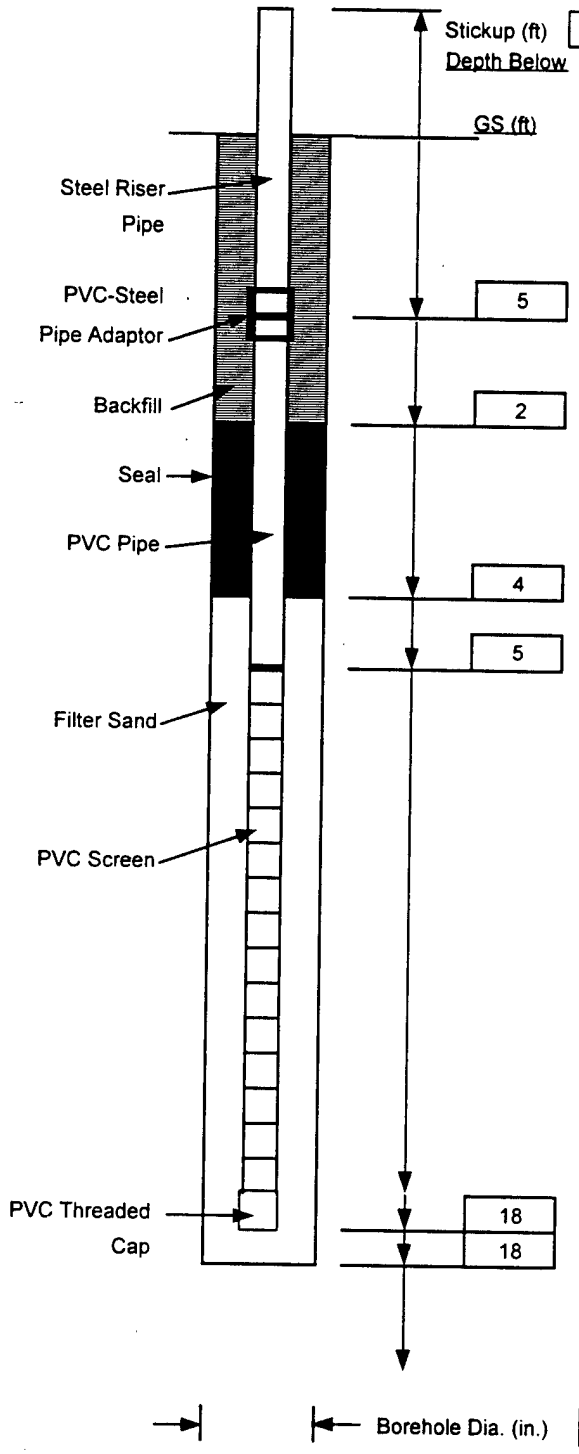
| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-32* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill - Gravel**<br>1-18ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br><br>18ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

5 10 15 20 25 30

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-32 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

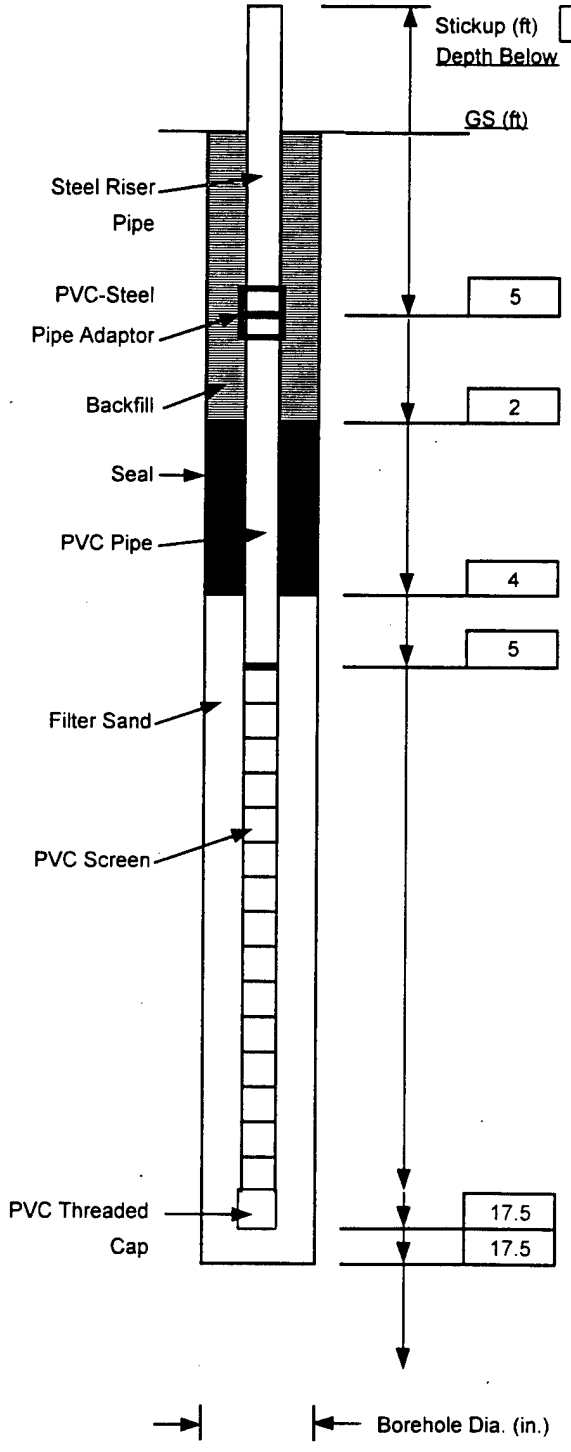
| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-33* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill - Gravel**<br>1-18.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br><br>18.5ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

AEW-33.xls

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-33 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13.5 |
| Placement | Pour |
| Amount Placed | 250lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

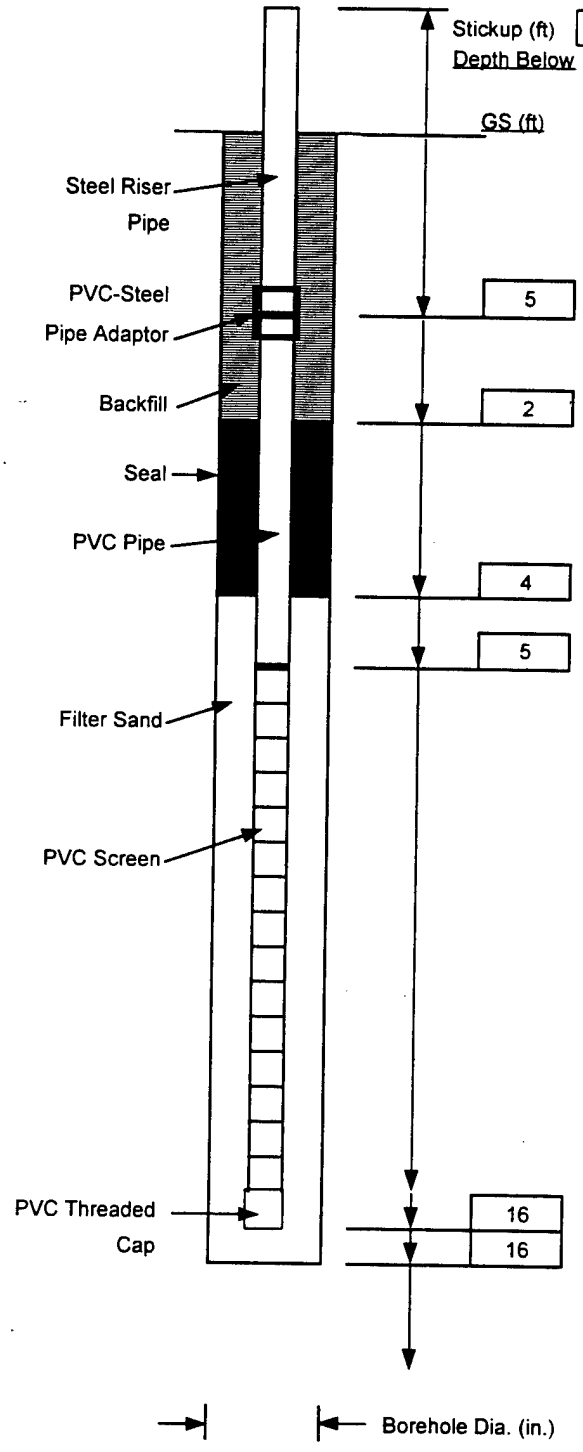
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-34* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-1ft: **Concrete**<br>1-2ft: **Fill - Gravel**<br>2-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br><br>16ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-34 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 200lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

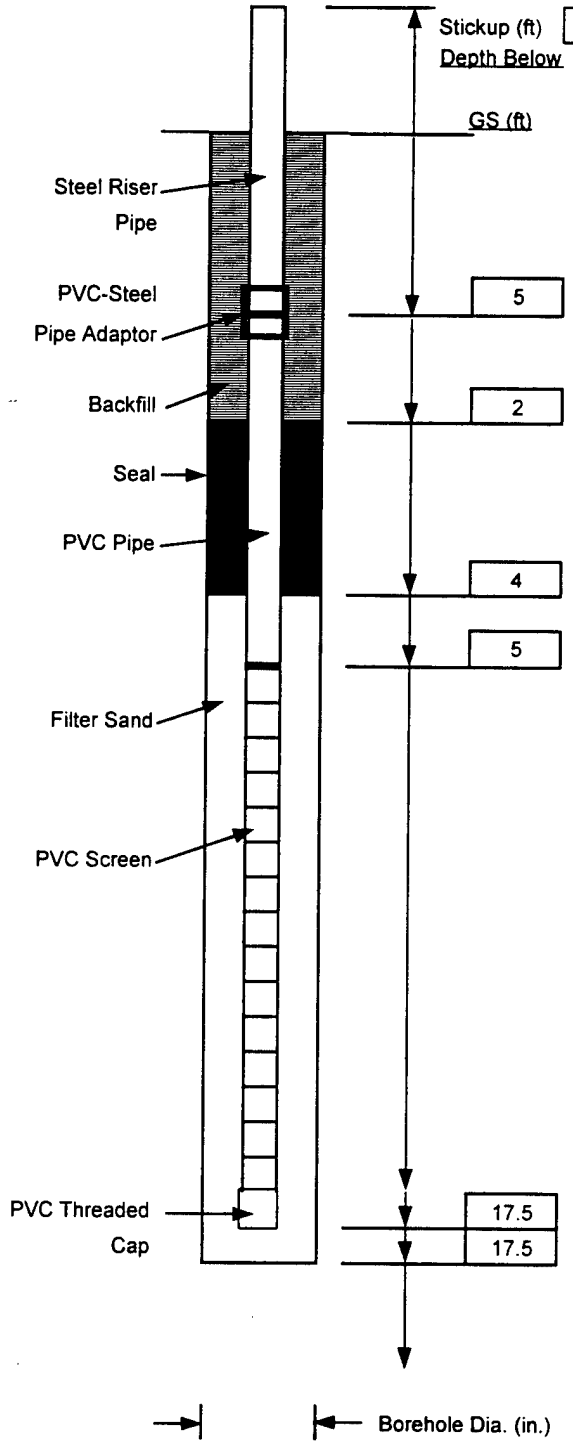
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-35* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-17.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| | 17.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-35 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13.5 |
| Placement | Pour |
| Amount Placed | 225lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

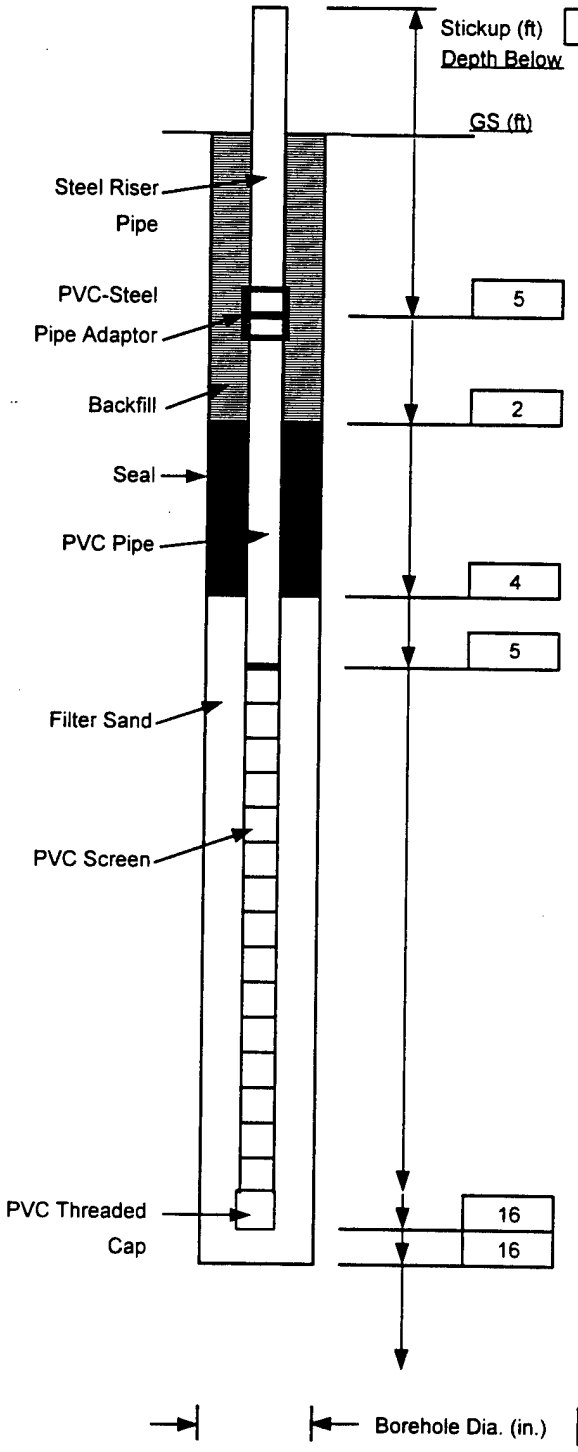
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-36* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/9/98* | *Date Completed: 9/9/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | 16ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-36 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/9/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/9/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

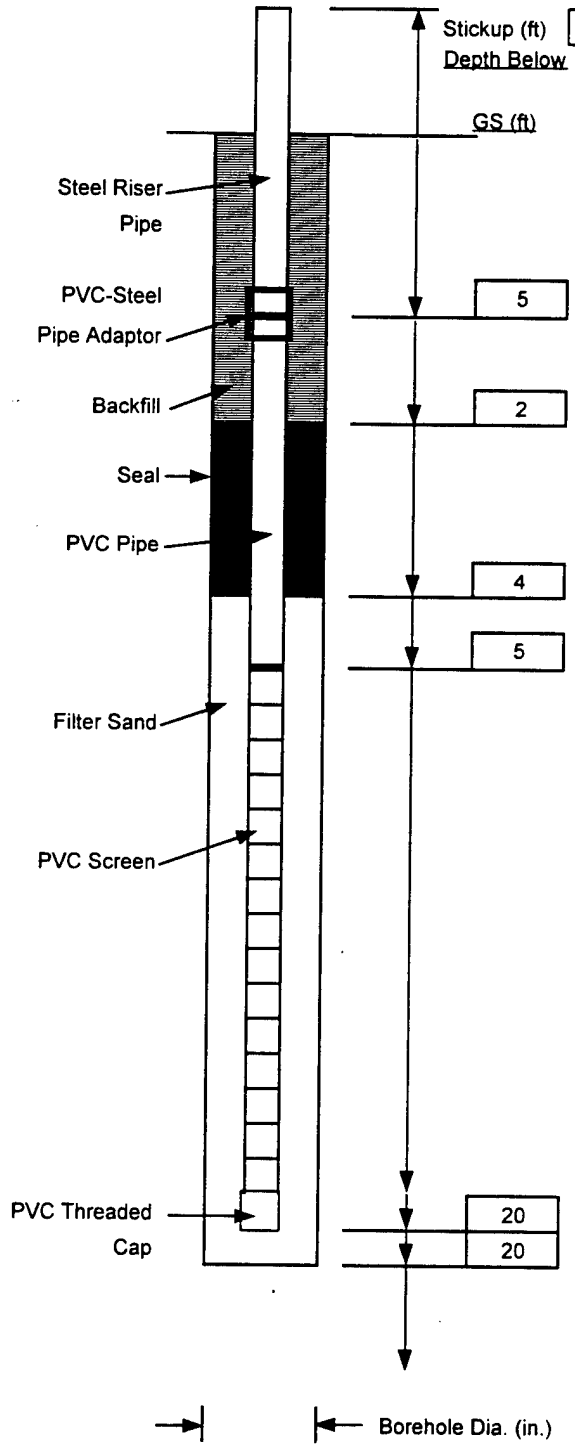
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-37* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-20ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br>20ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-37 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/2/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/2/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

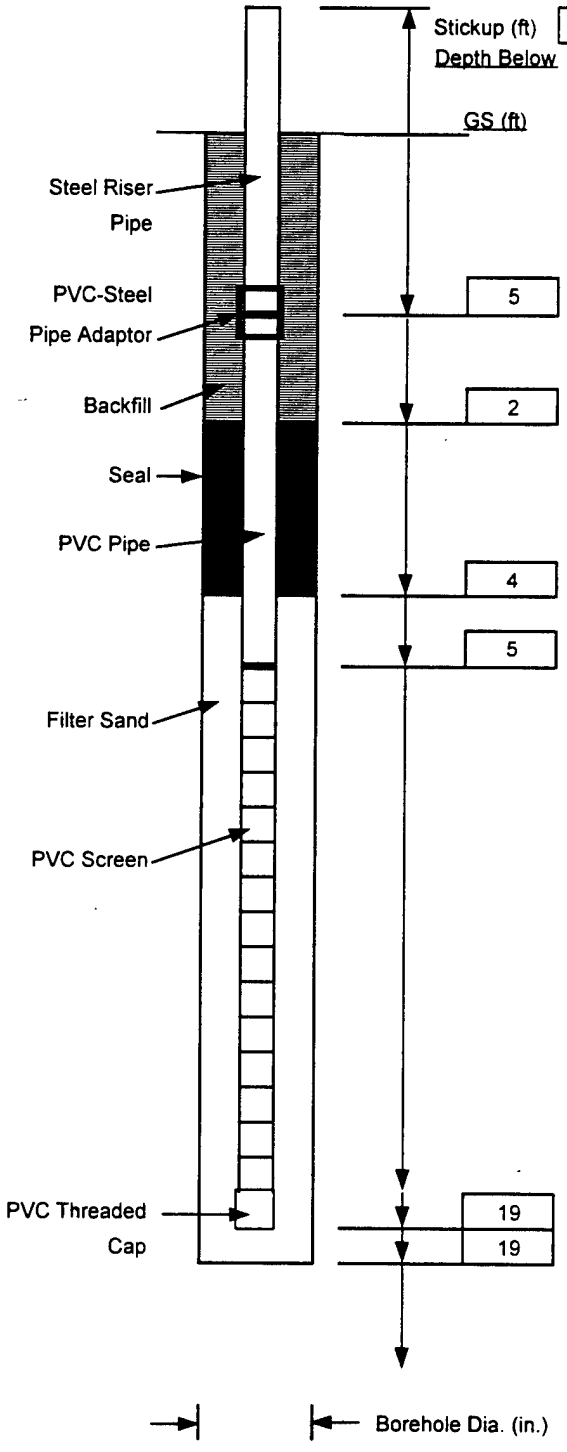
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-38* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-19ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | 5ft: Moist. | | | | |
| 10 | | | | | |
| 15 | | | | | |
| | 19ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-38 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/2/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/2/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 15 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

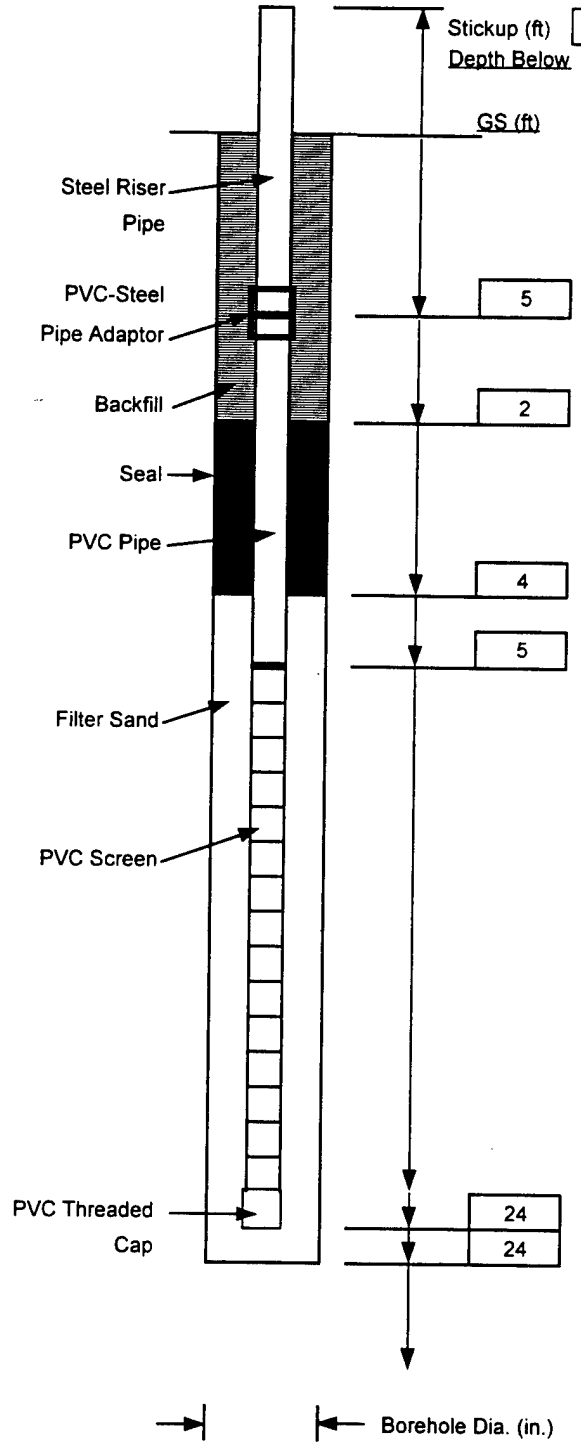
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-39* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/3/98* | *Date Completed: 9/3/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *24* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *24* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-24ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | 24ft: **Bedrock:** Limestone. | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-39 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/3/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/3/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | .350lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

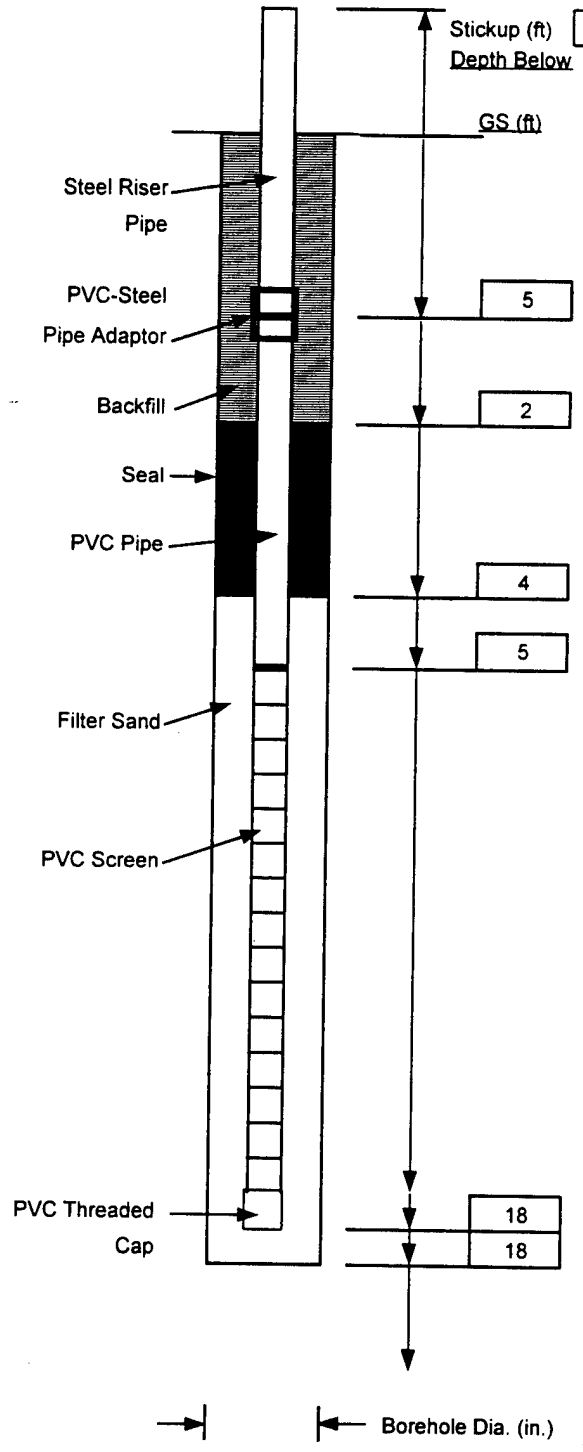
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-40* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/9/98* | *Date Completed: 9/9/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-18ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| | 8ft: V moist to wet. | | | | |
| 10 | | | | | |
| | 12ft: Clay fraction increase to 15%. | | | | |
| 15 | | | | | |
| | 18ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-40 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/9/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/9/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

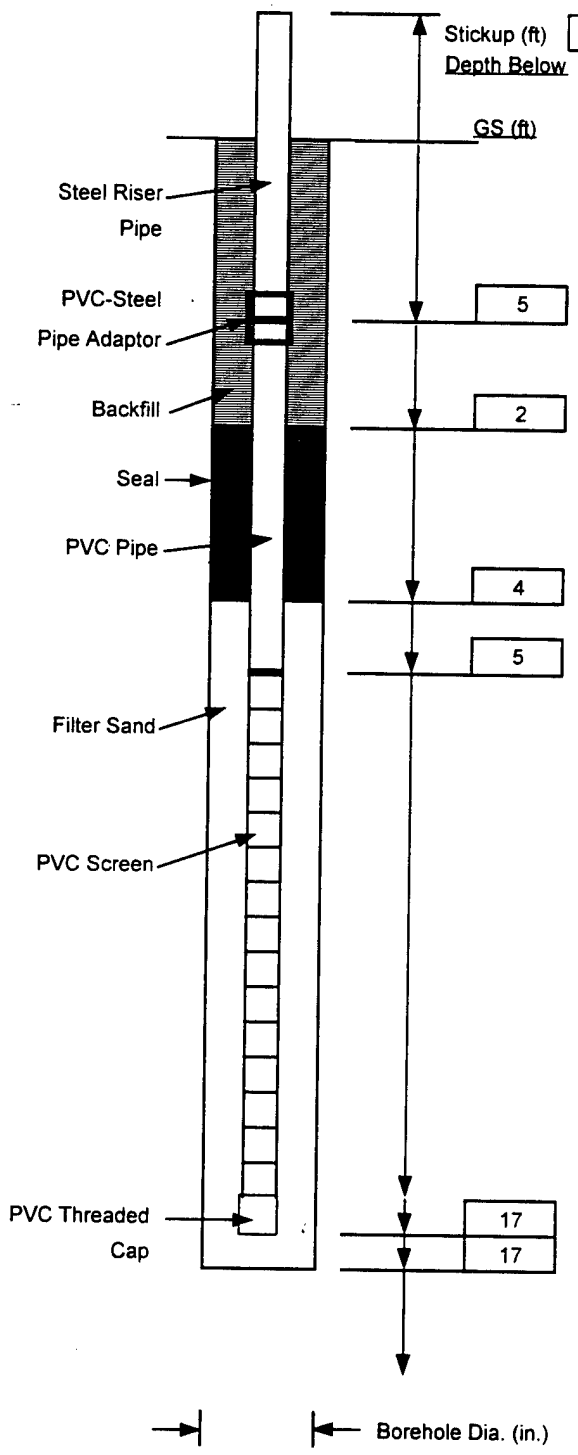
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-41* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/12/98* | *Date Completed: 9/12/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-17ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| | 17ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-41 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/12/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/12/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13 |
| Placement | Pour |
| Amount Placed | 275lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

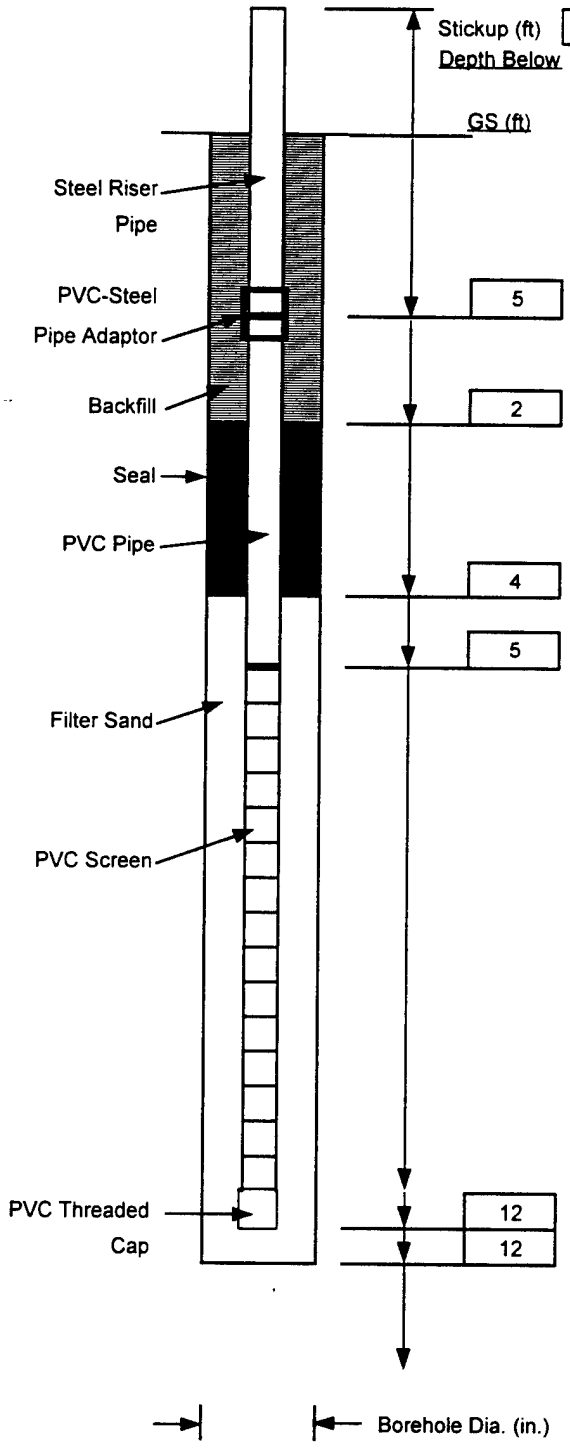
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-42* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *12* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *12* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Bond* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-12ft: **Gravelly silt/clay w/sand:** *(ML)*, olive gry (5Y4/1), gravels , 1cm mostly rounded, Larger ones mostly angular, moist to dry soils, w/depth color becomes intermingeld w/mod olive brn (5Y4/4). | | | | No samples required to be collected during installation |
| 10 | 12ft: **Bedrock:** Limestone. | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: AEW-42 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Bond |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 8 |
| Placement | Pour |
| Amount Placed | 150lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 7 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

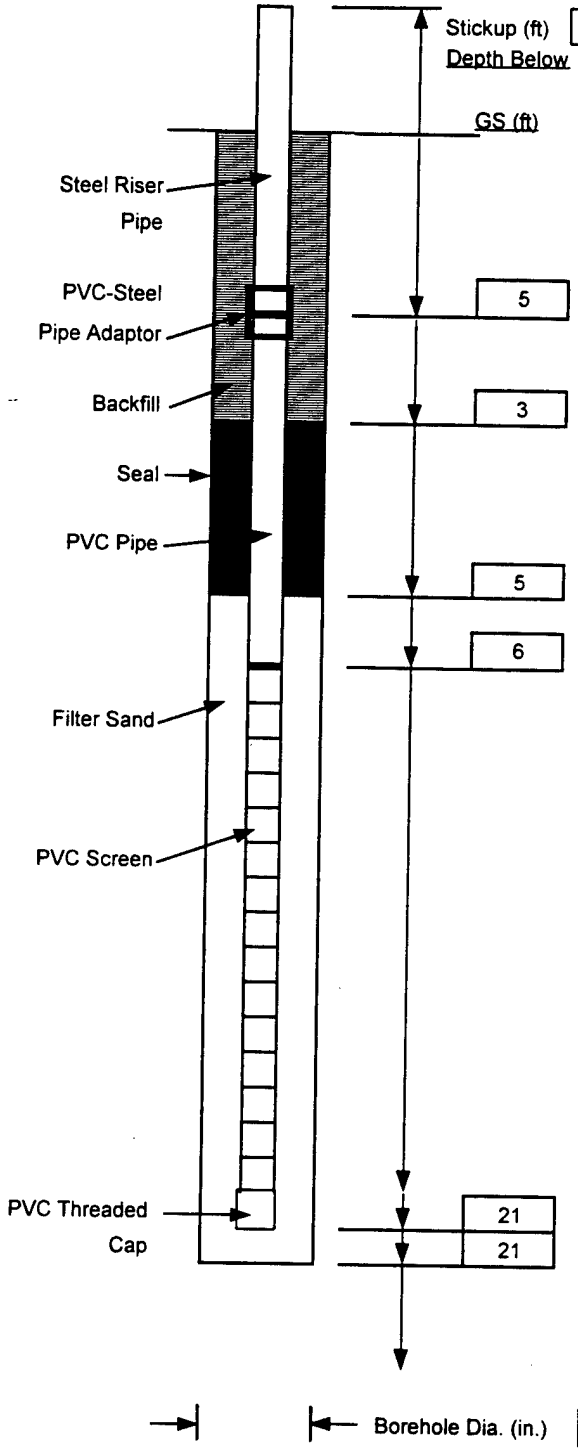
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-43* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *21* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *21* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-21ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 21ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-43 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/12/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/12/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | 1 |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 3 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 650lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

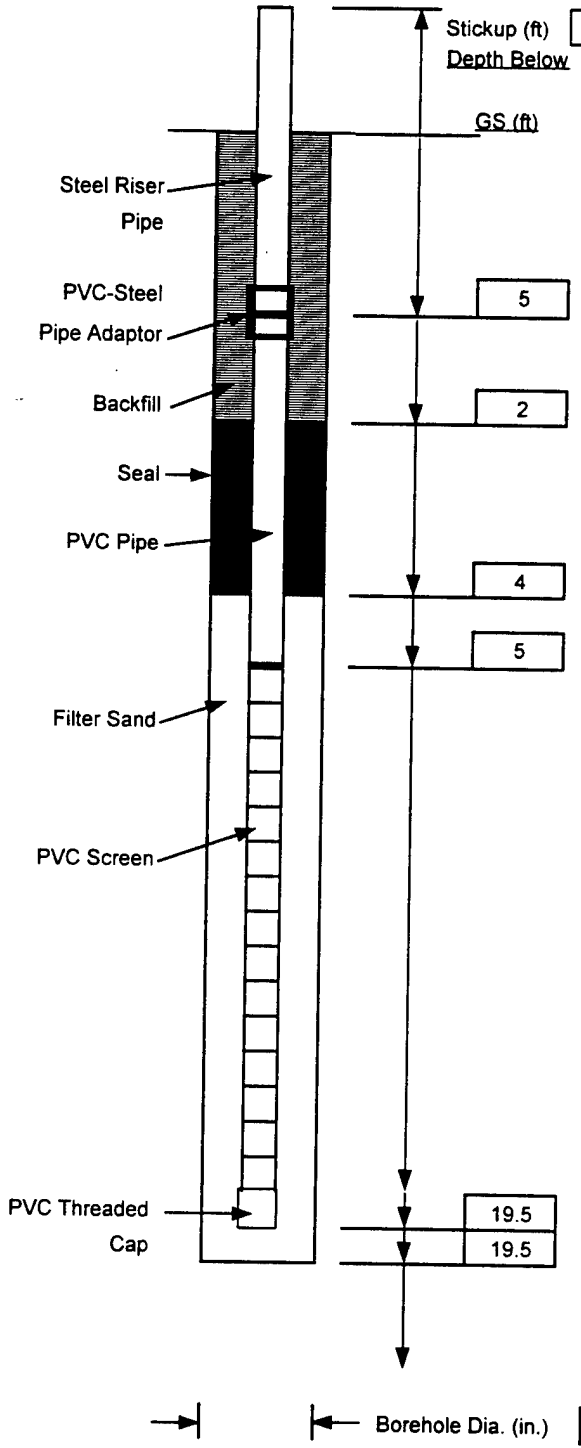
| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-44* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/9/98* | *Date Completed: 9/9/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *18* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-19.5ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd, moist.<br>3ft: Moist to v moist.<br>18ft: Wet - soupy cuttings.<br>19.5ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

AEW-44.xls

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-44 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/9/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/9/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | 18 | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 15.5 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 14.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

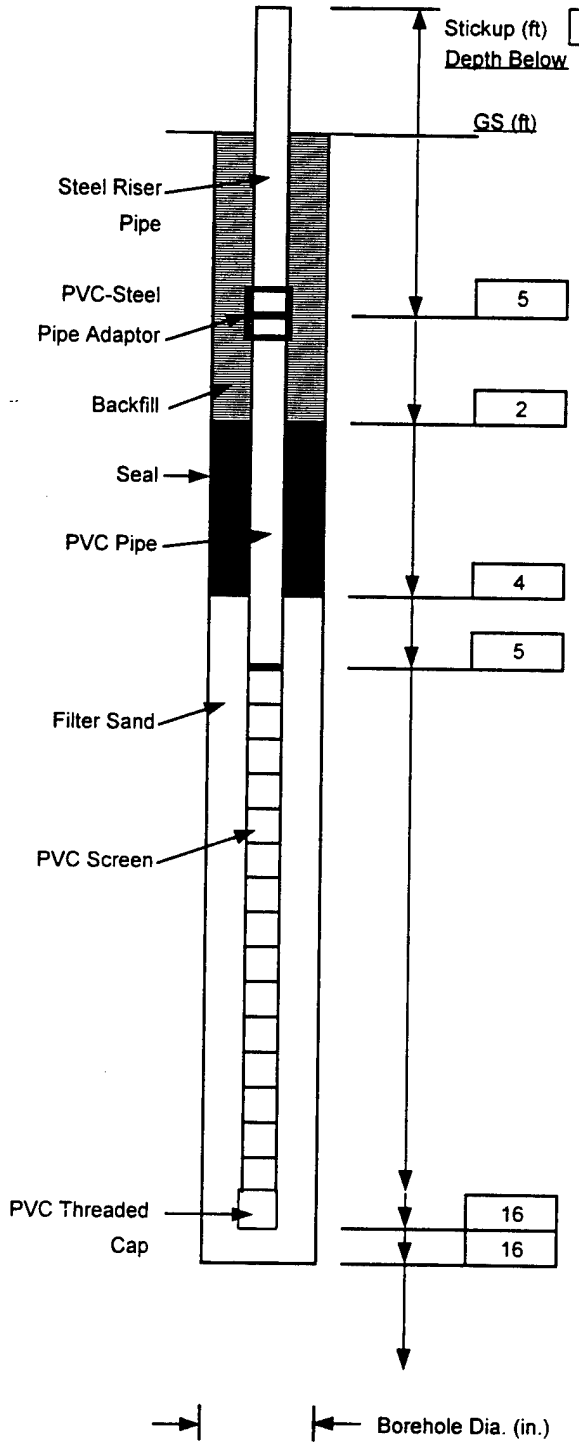
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-45* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/12/98* | *Date Completed: 9/12/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-16ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | 16ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-45 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/12/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/12/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

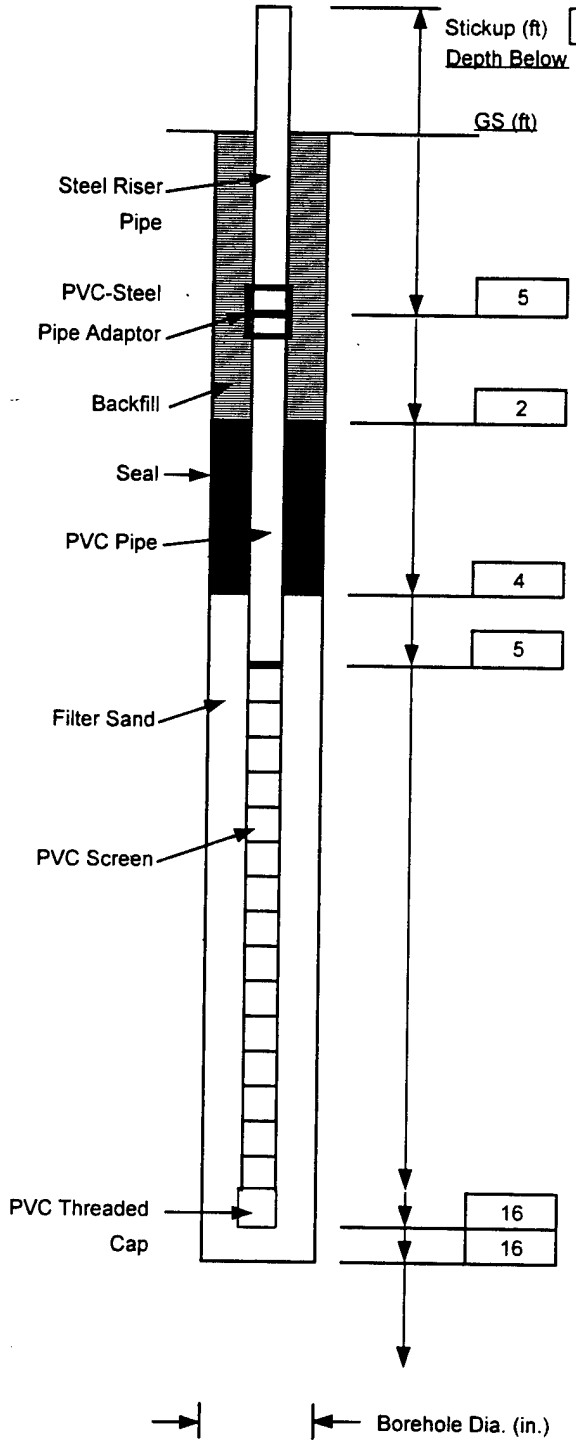
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-46 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started: 9/10/98 | Date Completed: 9/10/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 16 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 16 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 0 | 0-16ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | | | | | |
| 10 | | | | | |
| 15 | 16ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-46 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

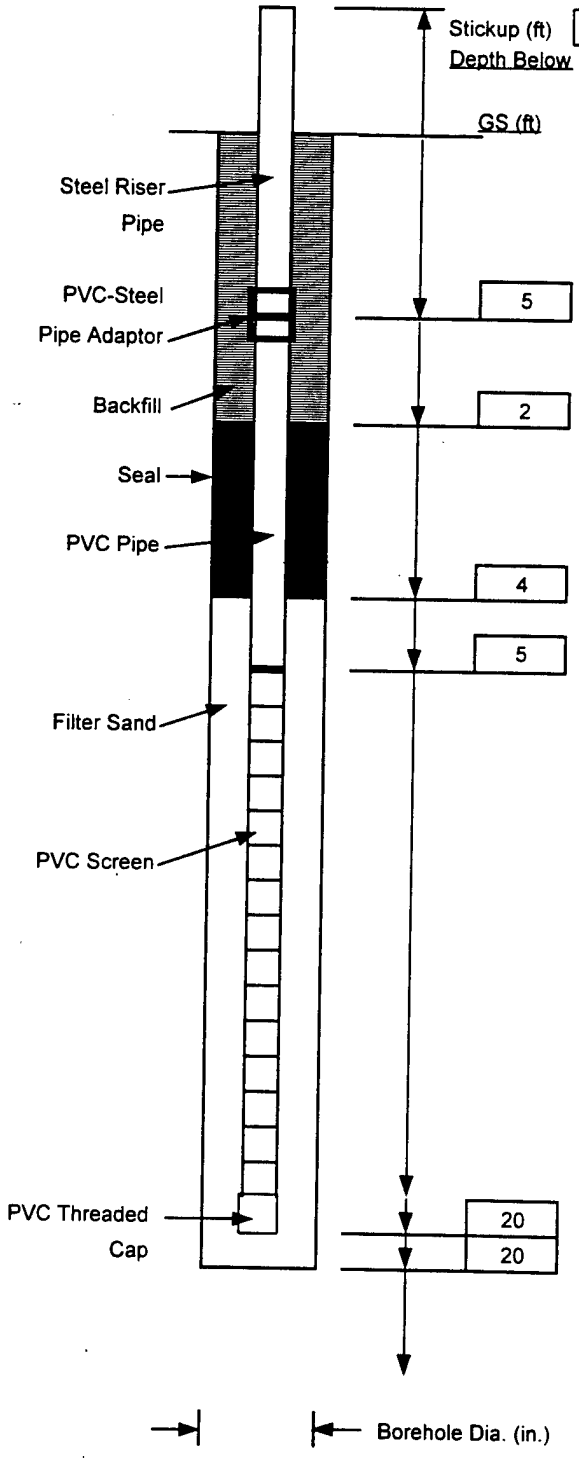
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-47* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required to be collected during installation |
| | 7-7.5ft: Cobble zone. | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-47 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/2/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/2/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 300lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

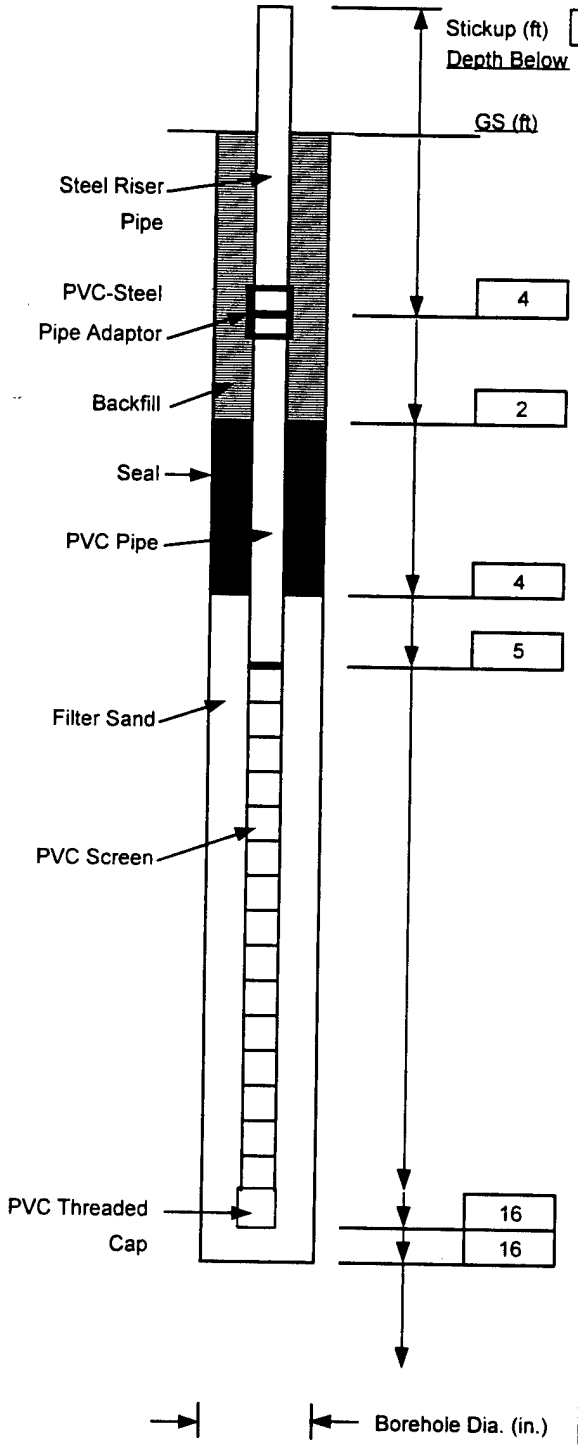
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: AEW-48 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started:9/12/98 | Date Completed: 9/12/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 16 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 16 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Soil Vapor Extraction Well<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-16ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br><br>16ft: **Bedrock:** Limestone. | | | | No samples required to be collected during installation |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-48 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/12/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/12/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12 |
| Placement | Pour |
| Amount Placed | 250lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

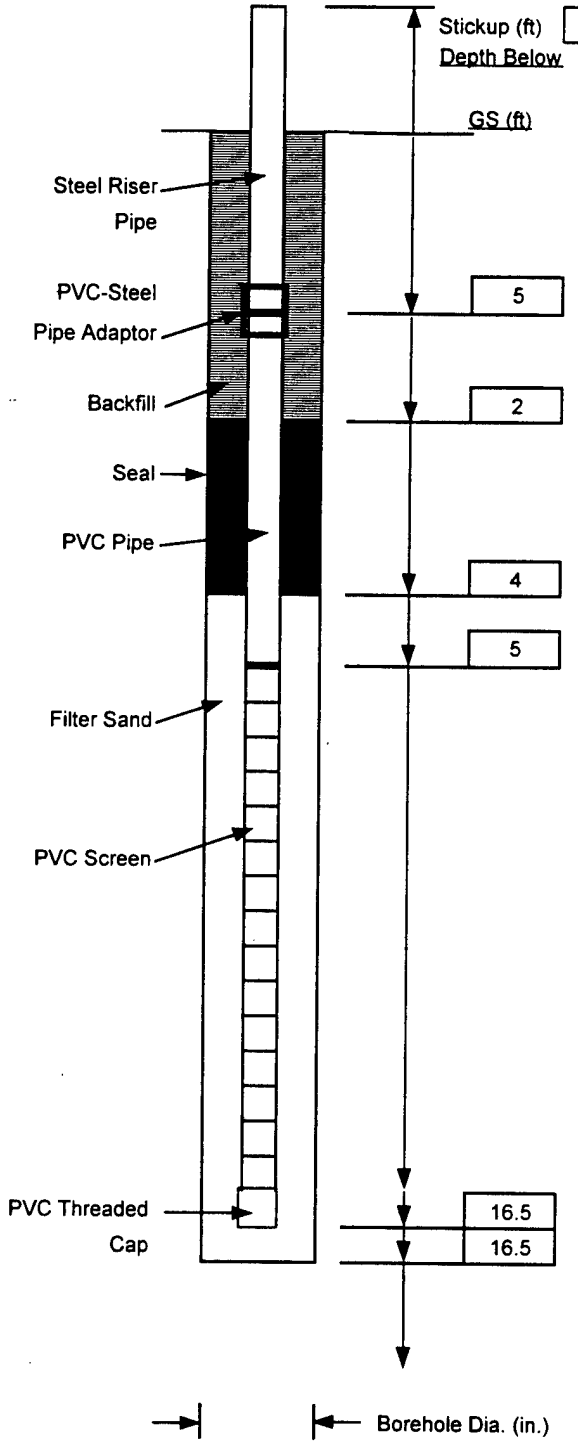
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-49* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *16.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *3* |
| *Completion: Completed as Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-10ft: **Fill - Gravel:** Moist. | | | | No samples required to be collected during installation |
| | 3ft: Wet. | | | | |
| 5 | | | | | |
| 10 | 10-16.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | |
| 15 | 16.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-49 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

Type: Schedule 40 Steel
Diameter (in.): 2
Length (ft): 6

**Riser Pipe 2**

Type: Schedule 40 PVC
Diameter (in.): 2
Length (ft): N/A

**Backfill**

Type: EZ mud/Benseal
Length (ft): 2
Placement: Pour

**Seal**

Type: Bentonite Pellets
Length (ft): 2
Placement: Pour

**Filter Pack**

Type: 10-20 Silica Sand
Length (ft): 12.5
Placement: Pour
Amount Placed: 250lbs

**Screen**

Type: Schedule 40 PVC
Length (ft): 11.5
Diameter (in.): 2
Slot Size (in.): 0.010
Slot Type: Machine Slotted

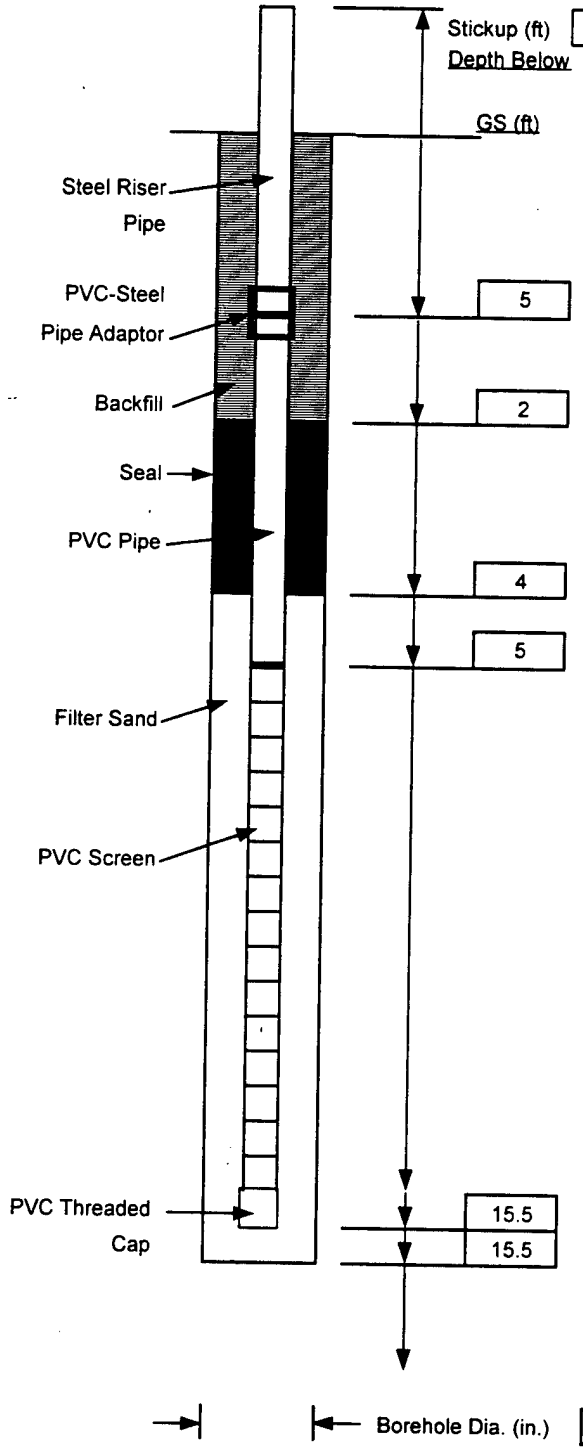
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-50* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *15.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *15.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Bond* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-15.5ft: **Gravelly silty clay w/sand:** *(ML)*, Lt olive brn (5Y5/6), gravels to 4cm, mostly rounded edges. | | | | No samples required to be collected during installation |
| 10 | | | | | |
| 15 | 15.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-50 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Bond |
| Driller: D. Bolstridge | Date Started: | 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 11.5 |
| Placement | Pour |
| Amount Placed | 200lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 10.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

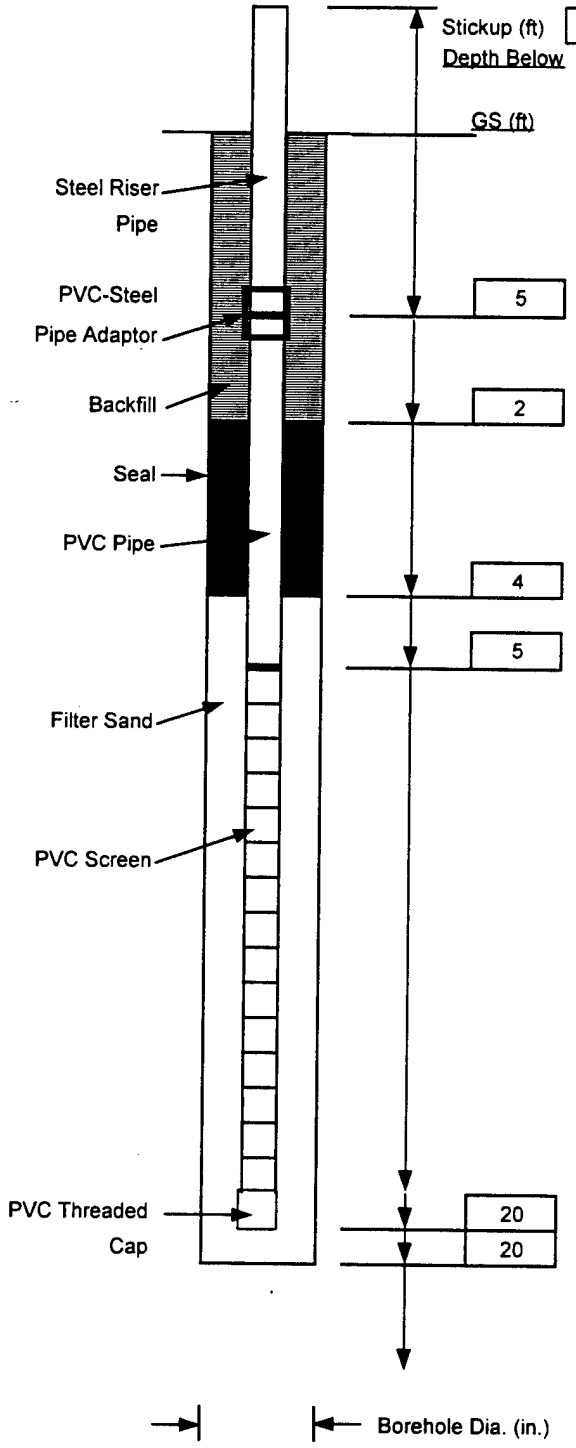
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-51* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-20ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required to be collected during installation |
| 5 | 6ft: Moist. | | | | |
| | 8ft: V moist. | | | | |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| | | | |
|---|---|---|---|
| Loring AFB | Site: JEBS | | Well No.: AEW-51 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 325lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

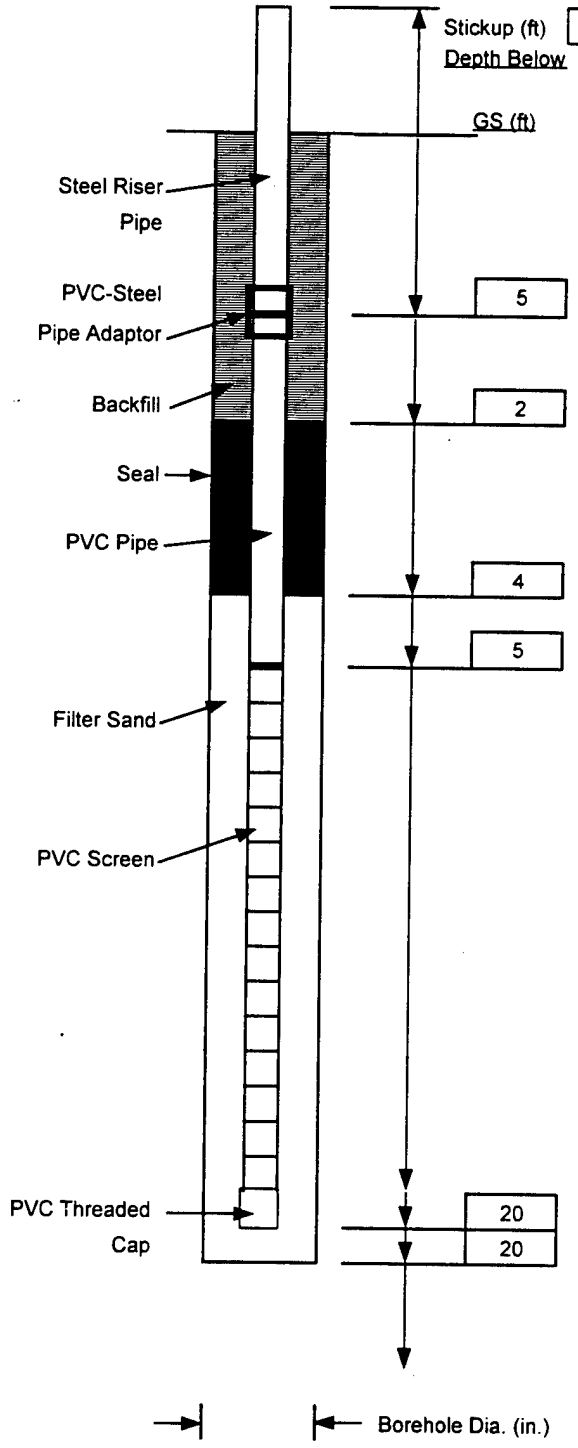
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: AEW-52* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as Soil Vapor Extraction Well* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-20ft: **Gravelly silty clay w/sand:** *(ML)*, Lt olive brn (5Y5/6), gravels to 4cm, mostly rounded edges.<br>4-6ft: Cobble zone.<br>8-8.5ft: Cobble zone. | | | | No samples required to be collected during installation. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

| Loring AFB | Site: JEBS | | Well No.: AEW-52 |
|---|---|---|---|
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | EZ mud/Benseal |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 275lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

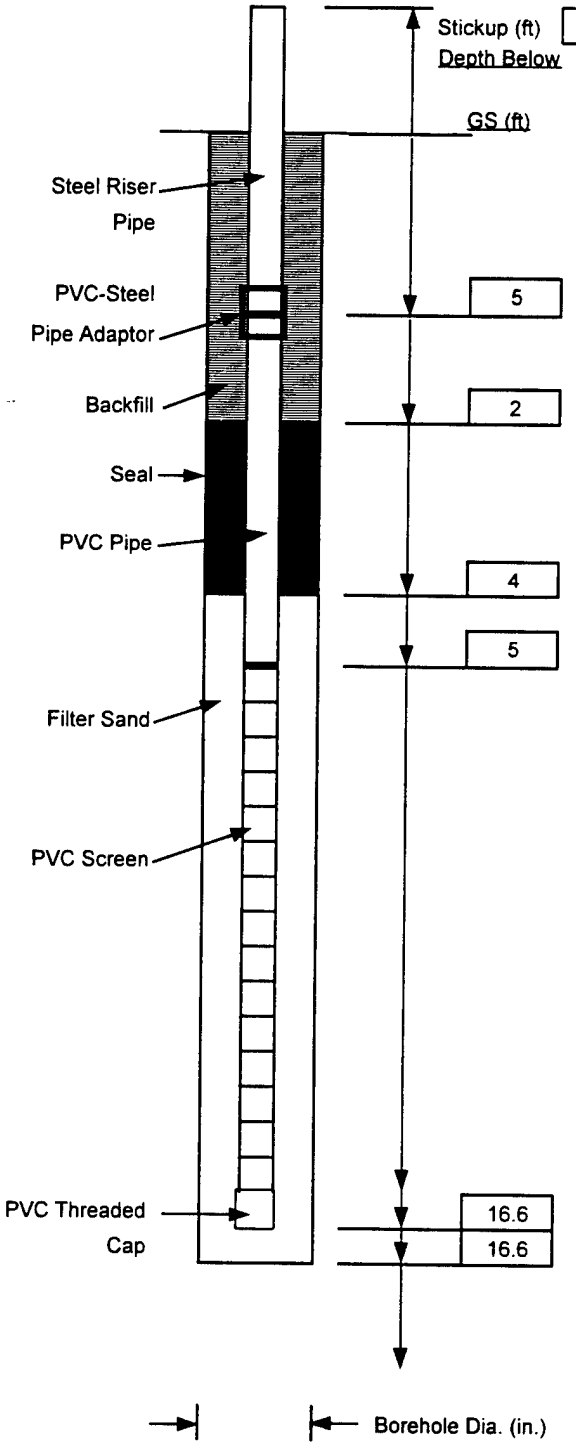
# BOREHOLE LOG

| | | |
|---|---|---|
| Project Name: Loring AFB | | Borehole No.: PAV-1 |
| Project Number: 22784 | Elevation: TBD | |
| Location: JEBS | Date Started:9/11/98 | Date Completed: 9/11/98 |
| Driller: Great Works Drilling | Total Depth (ft): | 15.6 |
| Equipment: Mobile B59 | Depth to Bedrock (ft): | 15.6 |
| Drilling Method: Hollow Stem Auger | Hole Diameter (in): | 8 |
| Drilling Fluid: None | Depth to Water (ft): | TBD |
| Completion: Completed as a Passive Air Vent<br>See Construction Log for details | Logged By: P. Linley | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-15.6ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd. | | | | No samples required for collection.<br>Auger refusal at 3ft BGL, relocated approx. 3ft south southeast of original location. |
| 10 | | | | | |
| 15 | 15.6ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-1 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 12.6 |
| Placement | Pour |
| Amount Placed | 225 lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 11.6 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

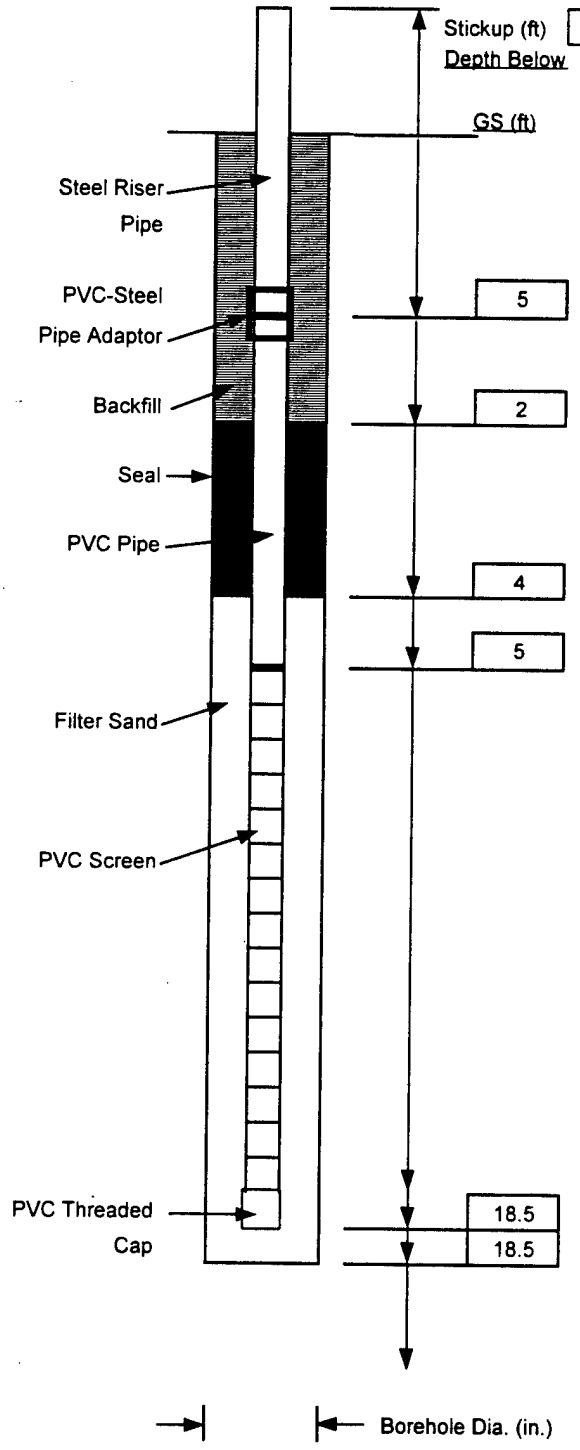
| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-2* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-18.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.<br><br>18.5ft: **Bedrock:** Limestone. | | | | No samples required for collection. |

5 10 15 20 25 30

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-2 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14.5 |
| Placement | Pour |
| Amount Placed | 300 lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

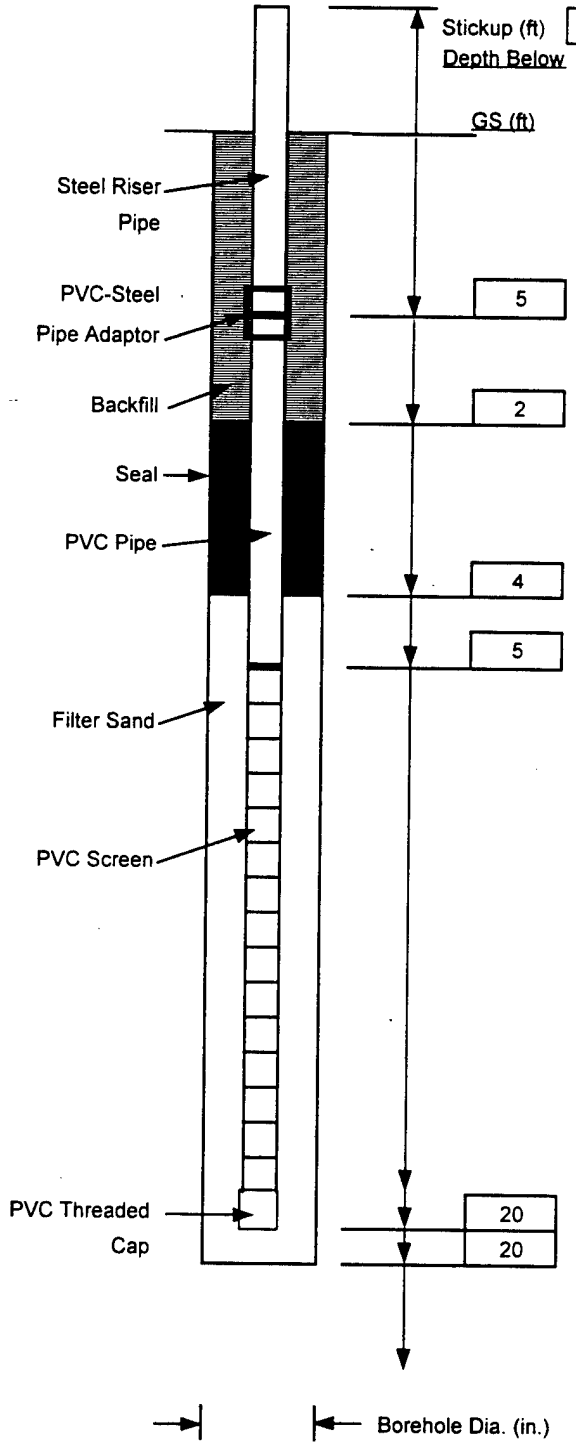
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-3* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *20* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *20* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-20ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter. | | | | No samples required for collection. |
| 10 | 8ft: Clay fraction increase to 20%.<br>9ft: Clay fraction decrease to 10%. | | | | |
| 15 | | | | | |
| 20 | 18ft: Clay fraction increase to 20%, moist to v moist.<br>20ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-3 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 16 |
| Placement | Pour |
| Amount Placed | 650 lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 15 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

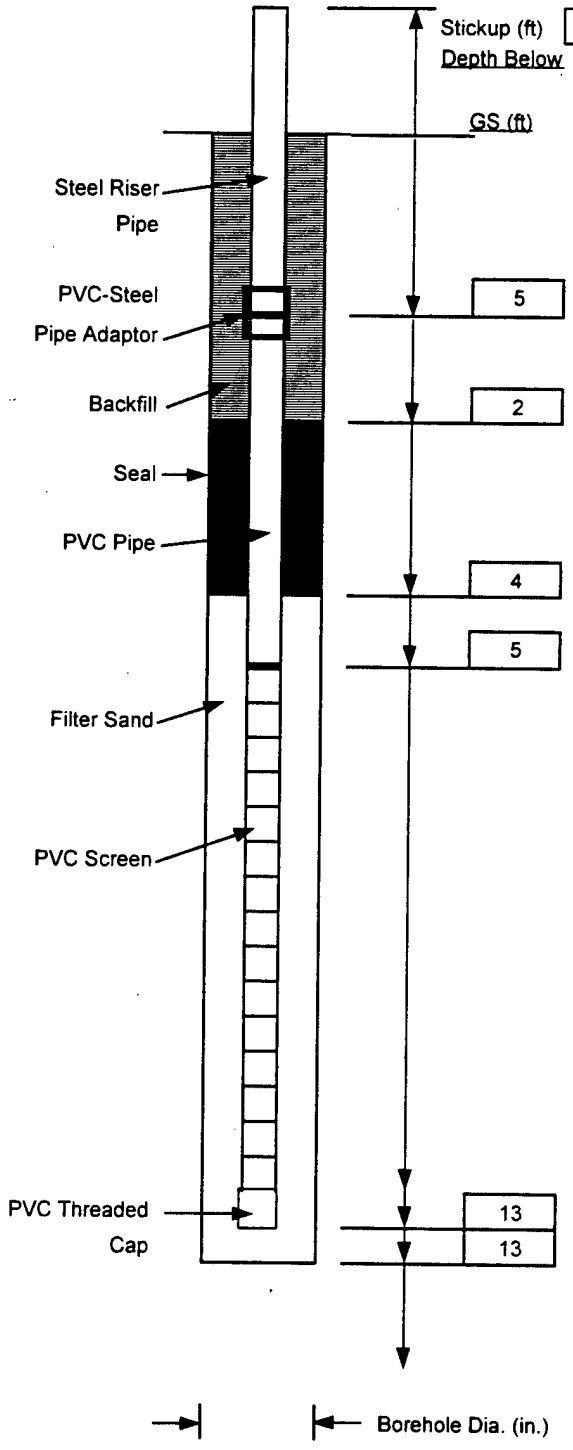
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-4* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:8/31/98* | *Date Completed: 8/31/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *13* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *13* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *8* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-13ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, grl to 3-4 inches in diameter.<br><br>6ft: V moist, cobble zone.<br><br>8ft: Wet - Soupy, septic oder.<br><br>13ft: **Bedrock:** Limestone. | | | | No samples required for collection. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-4 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 8/31/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 8/31/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: 8 | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | .9 |
| Placement | Pour |
| Amount Placed | 200 lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 8 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

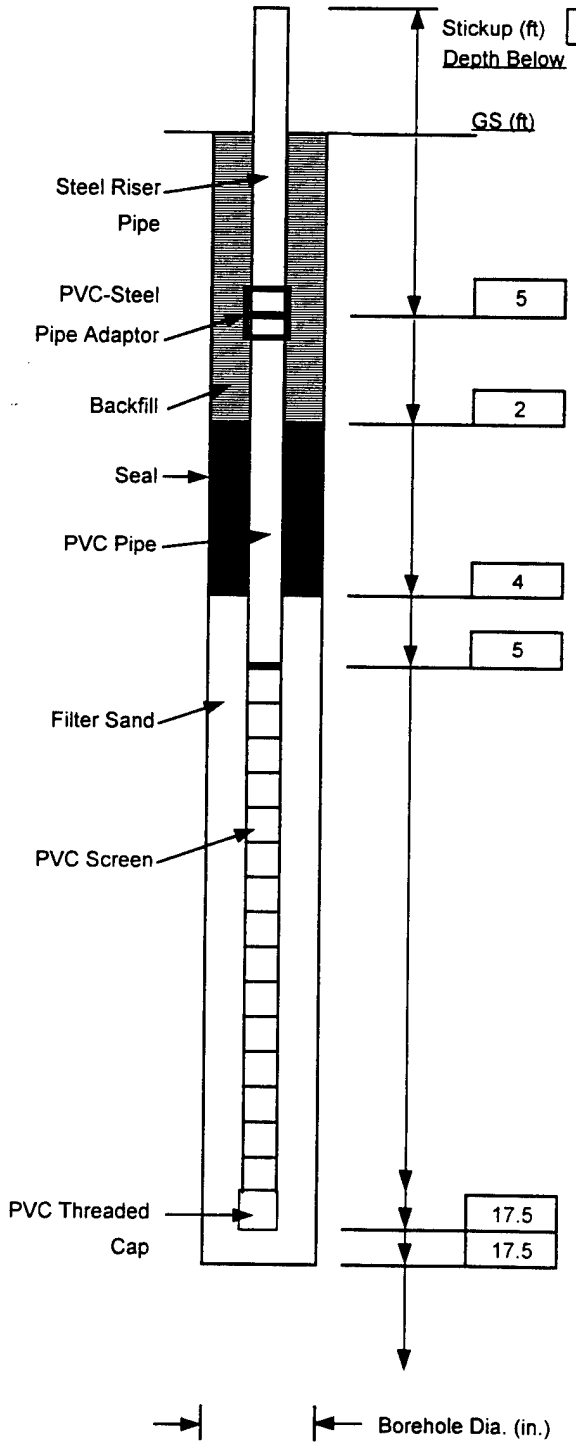
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-5* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/1/98* | *Date Completed: 9/1/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.5ft: **Concrete**<br>0.5-1ft: **Fill**<br>1-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required for collection. |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| | 17.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-5 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/1/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/1/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13.5 |
| Placement | Pour |
| Amount Placed | 250 lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

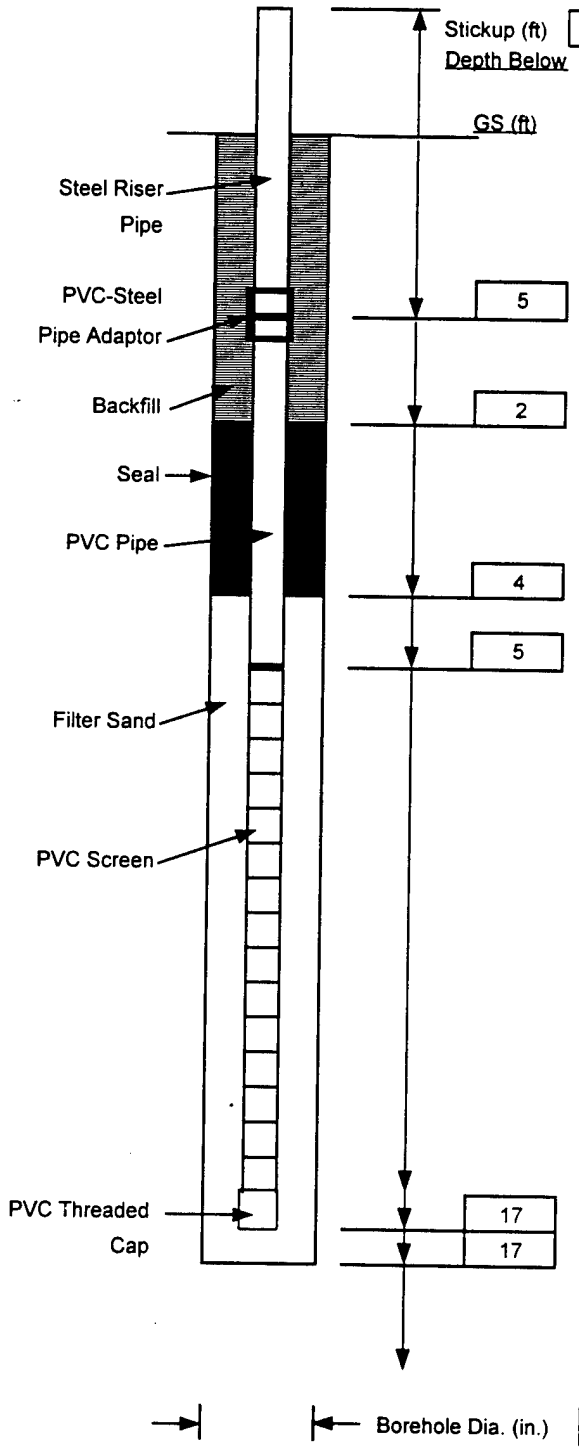
| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-6* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-1ft: **Concrete**<br>1-2ft: **Fill - Gravel**<br>2-17ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.<br><br>17ft: **Bedrock:** Limestone. | | | | No samples required for collection. |

PAV-6.xls

# BIOVENTING WELL CONSTRUCTION LOG

| Loring AFB | Site: JEBS | | Well No.: PAV-6 |
|---|---|---|---|
| Drilling Company: Great Works Drilling | Project No.: 22748 | | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: | 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: | 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: | TBD | |
| Drilling Fluid: None | Elevation: | TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 13 |
| Placement | Pour |
| Amount Placed | 225 lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 12 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

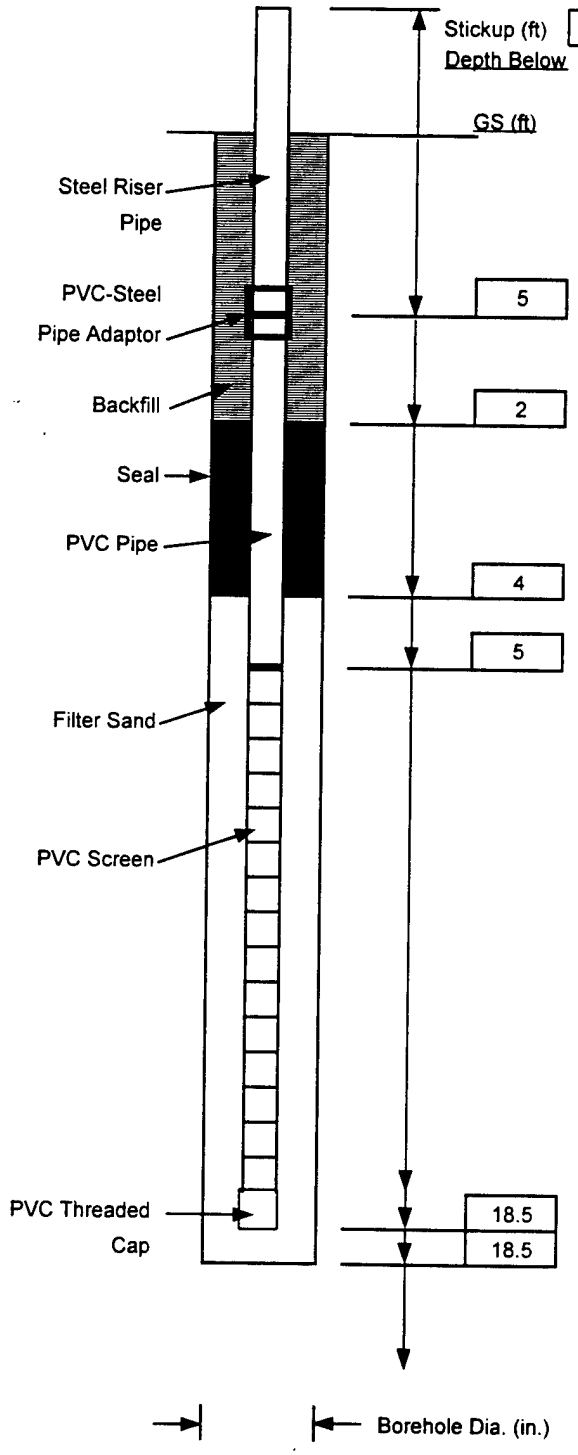
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-7* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-18.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd, moist. | | | | No samples required for collection. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 18.5ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-7 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/2/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/2/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

**Riser Pipe 1**

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

**Riser Pipe 2**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

**Backfill**

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

**Seal**

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14.5 |
| Placement | Pour |
| Amount Placed | 275 lbs |

**Screen**

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-8* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *17.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent*<br>See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-0.25ft: **Asphalt**<br>0.25-0.75ft: **Fill - Gravel**<br>0.75-17.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld, poorly sorted, subang to subrd.<br><br>7ft: moist.<br><br>17.5ft: **Bedrock:** Limestone. | | | | No samples required for collection. |

5 10 15 20 25 30

# REQUEST FOR INFORMATION (RFI)

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006 RFI NO: 292

LOCATION: Limestone, Maine PAGE 1 OF 1

TO: John Mueller OF: AFCEE/ERB-L

| REFERENCE DRAWING: N/A | SPECIFICATION: N/A |
|---|---|

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:

Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund

REPLY REQUIRED BY: 9/15/98

9-Sep-98 — DATE

BEI — CONTRACTOR

## INFORMATION TO CONTRACTOR

| TO: Eric Berglund | FROM: John Mueller |
|---|---|
| OF: BEI | OF: AFCEE |

REQUESTED INFORMATION:

Approved per the attached email from AFBCA, Denis St. Peter.

9-14-98 — DATE

AFCEE/ERB-L

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

Denis St. Peter

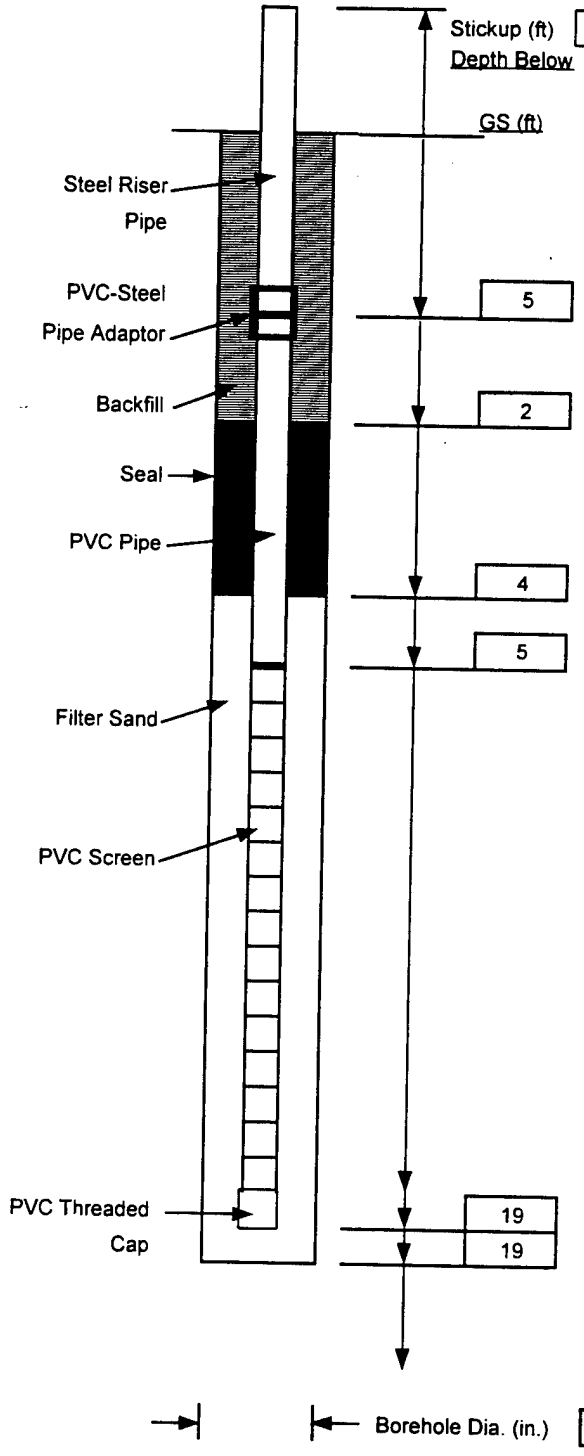
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-9* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/2/98* | *Date Completed: 9/2/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *19* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *19* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | Relocated approx. 1.5ft east of original location for rig access. |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-19ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. | | | | No samples required for collection. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | 19ft: **Bedrock:** Limestone. | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-9 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/2/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/2/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

Type: Schedule 40 Steel
Diameter (in.): 2
Length (ft): 6

### Riser Pipe 2

Type: Schedule 40 PVC
Diameter (in.): 2
Length (ft): N/A

### Backfill

Type: Volclay
Length (ft): 2
Placement: Pour

### Seal

Type: Bentonite Pellets
Length (ft): 2
Placement: Pour

### Filter Pack

Type: 10-20 Silica Sand
Length (ft): 15
Placement: Pour
Amount Placed: 275 lbs

### Screen

Type: Schedule 40 PVC
Length (ft): 14
Diameter (in.): 2
Slot Size (in.): 0.010
Slot Type: Machine Slotted

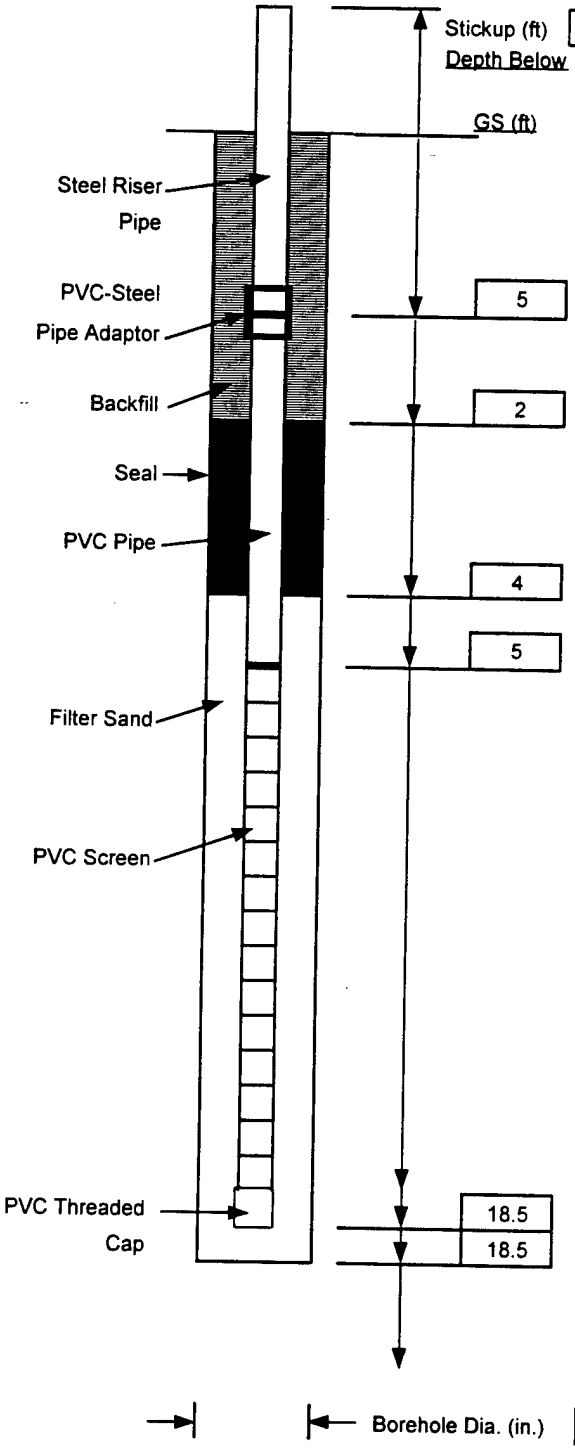
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: PAV-10* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/10/98* | *Date Completed: 9/10/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18.5* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *18.5* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *8* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as a Passive Air Vent* See Construction Log for details | *Logged By: P. Linley* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| | 0-18.5ft: **Gravelly Clayey Silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required for collection. |
| 5 | | | | | |
| 10 | | | | | |
| 15 | | | | | |
| | 18.5ft: **Bedrock:** Limestone. | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# BIOVENTING WELL CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Well No.: PAV-10 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: P. Linley |
| Driller: D. Bolstridge | Date Started: 9/10/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/10/1998 | |
| Drilling Method: Hollow Stem Auger | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

### Riser Pipe 1

| | |
|---|---|
| Type | Schedule 40 Steel |
| Diameter (in.) | 2 |
| Length (ft) | 6 |

### Riser Pipe 2

| | |
|---|---|
| Type | Schedule 40 PVC |
| Diameter (in.) | 2 |
| Length (ft) | N/A |

### Backfill

| | |
|---|---|
| Type | Volclay |
| Length (ft) | 2 |
| Placement | Pour |

### Seal

| | |
|---|---|
| Type | Bentonite Pellets |
| Length (ft) | 2 |
| Placement | Pour |

### Filter Pack

| | |
|---|---|
| Type | 10-20 Silica Sand |
| Length (ft) | 14.5 |
| Placement | Pour |
| Amount Placed | 250 lbs |

### Screen

| | |
|---|---|
| Type | Schedule 40 PVC |
| Length (ft) | 13.5 |
| Diameter (in.) | 2 |
| Slot Size (in.) | 0.010 |
| Slot Type | Machine Slotted |

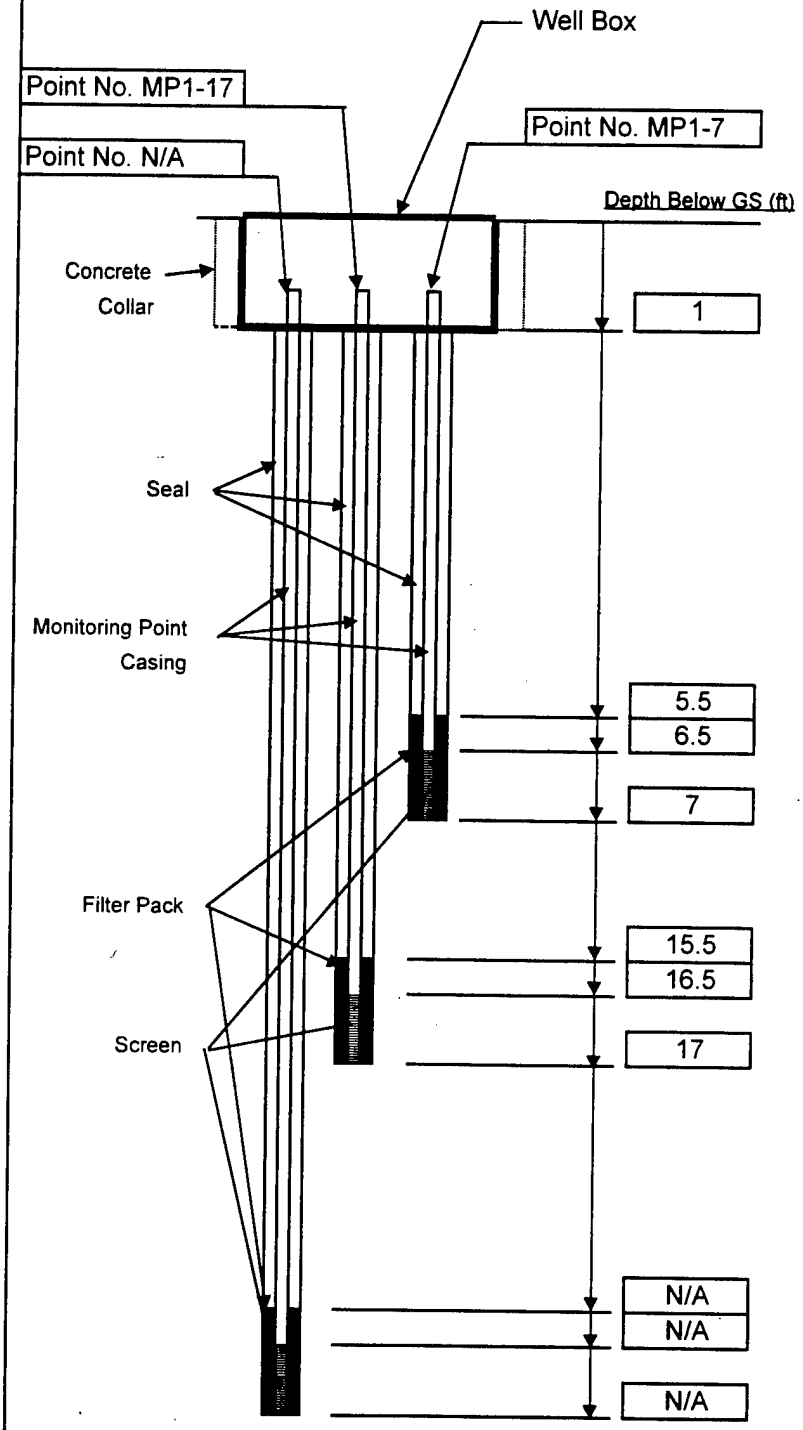
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-1* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *17* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point*<br>See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-17ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-1 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: ####### | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: ####### | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

**Monitoring Point Casing**

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

**Seal**

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

**Screen**

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

**Borehole**

| | |
|---|---|
| Diameter (in.) | 3 |

**Concrete Collar**

| | |
|---|---|
| Outer Diameter (in.) | N/A |

**Well Box**

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

## SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-1-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-1-17 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

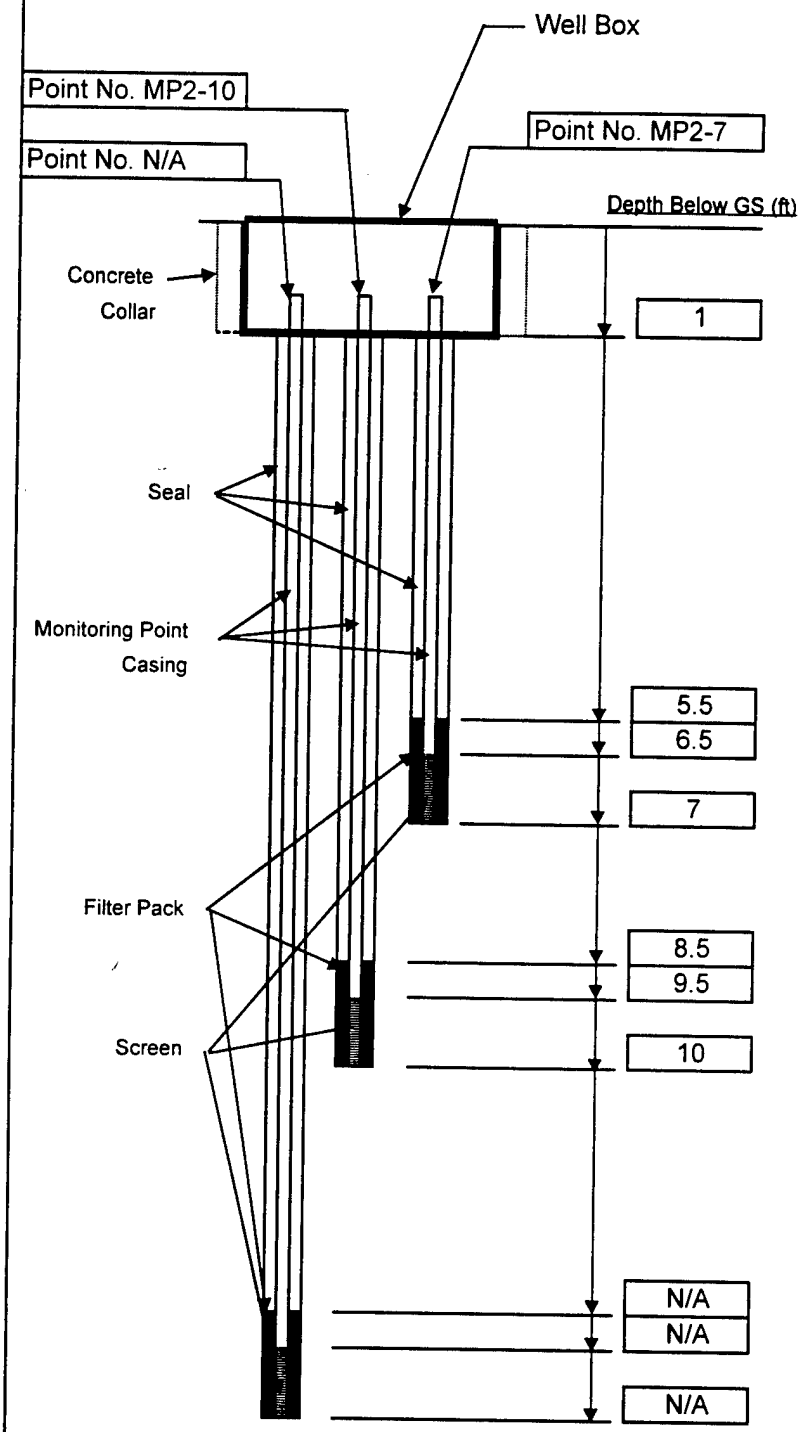
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-2* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *10* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point* See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5 | 0-10ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |
| 10 | | | | | |
| 15 | | | | | |
| 20 | | | | | |
| 25 | | | | | |
| 30 | | | | | |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-2 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: ####### | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: ####### | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

**Monitoring Point Casing**

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

**Seal**

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

**Screen**

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

**Borehole**

| | |
|---|---|
| Diameter (in.) | 3 |

**Concrete Collar**

| | |
|---|---|
| Outer Diameter (in.) | N/A |

**Well Box**

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

## SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-2-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-2-10 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

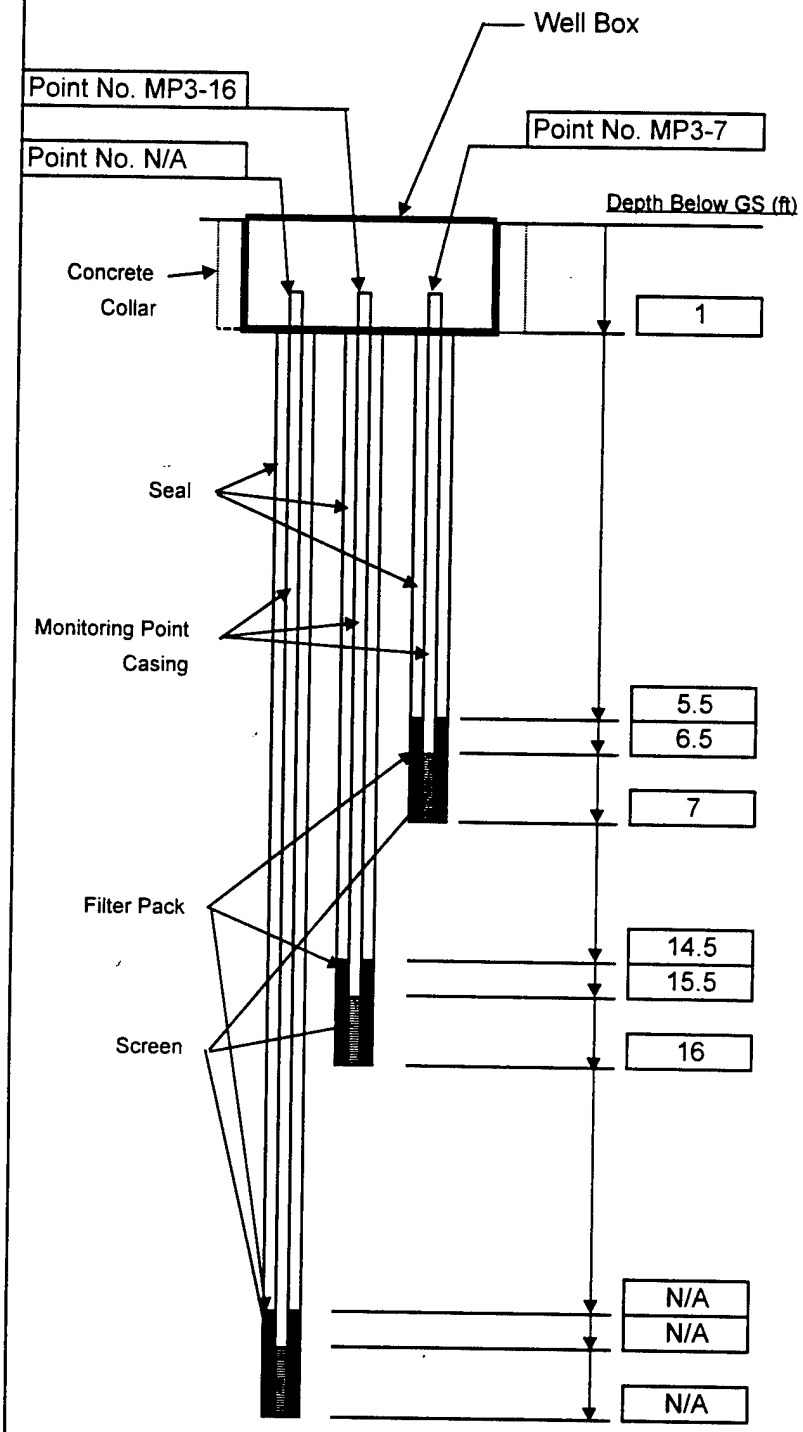
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-3* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point* See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-3 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: ####### | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: ####### | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




MATERIALS

Monitoring Point Casing

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

Seal

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

Filter Pack

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

Screen

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

Borehole

| | |
|---|---|
| Diameter (in.) | 3 |

Concrete Collar

| | |
|---|---|
| Outer Diameter (in.) | N/A |

Well Box

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-3-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-3-16 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

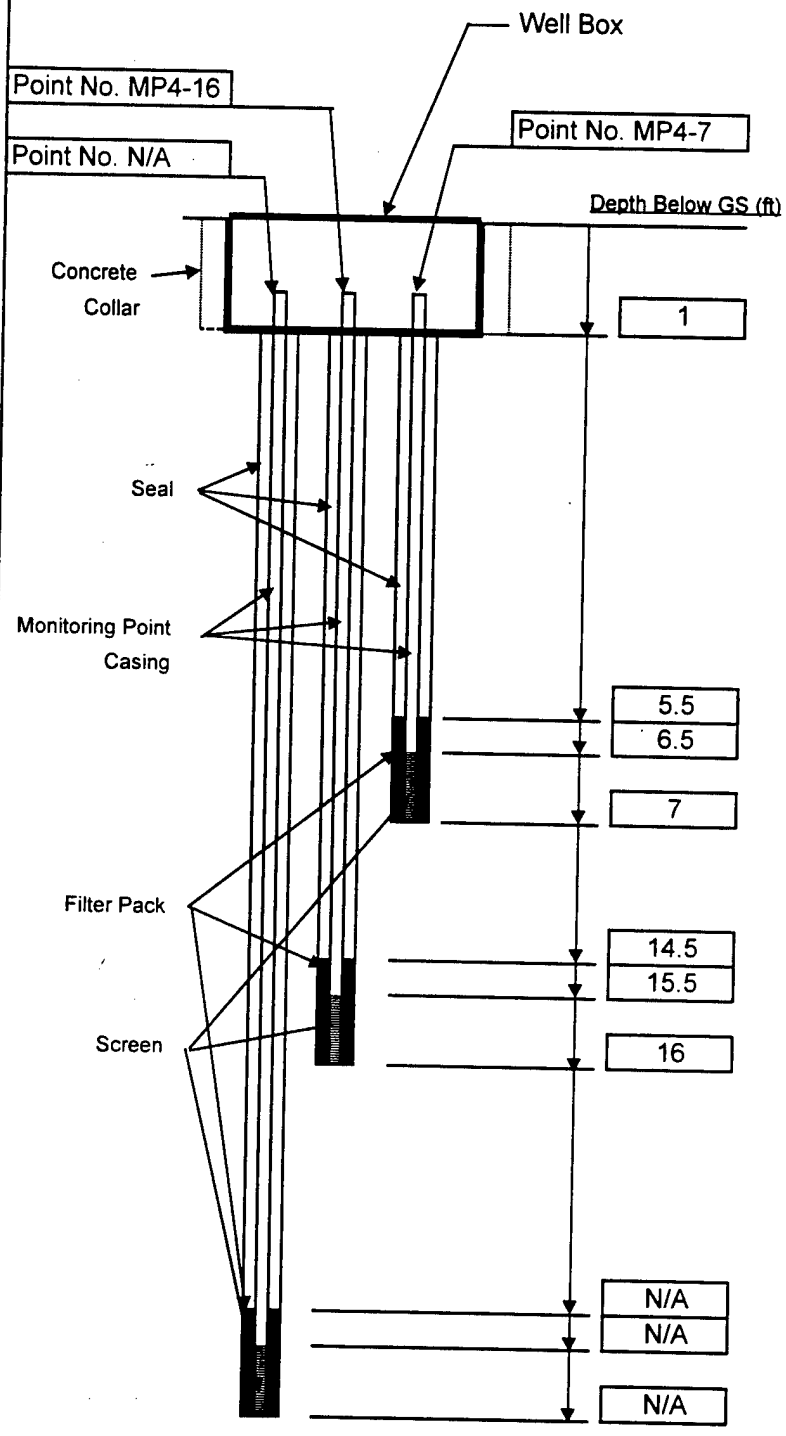
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-4* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *16* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point*<br>See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-16ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-4 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: ####### | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: ####### | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

**Monitoring Point Casing**

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

**Seal**

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

**Screen**

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

**Borehole**

| | |
|---|---|
| Diameter (in.) | 3 |

**Concrete Collar**

| | |
|---|---|
| Outer Diameter (in.) | N/A |

**Well Box**

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

## SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-4-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-4-16 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

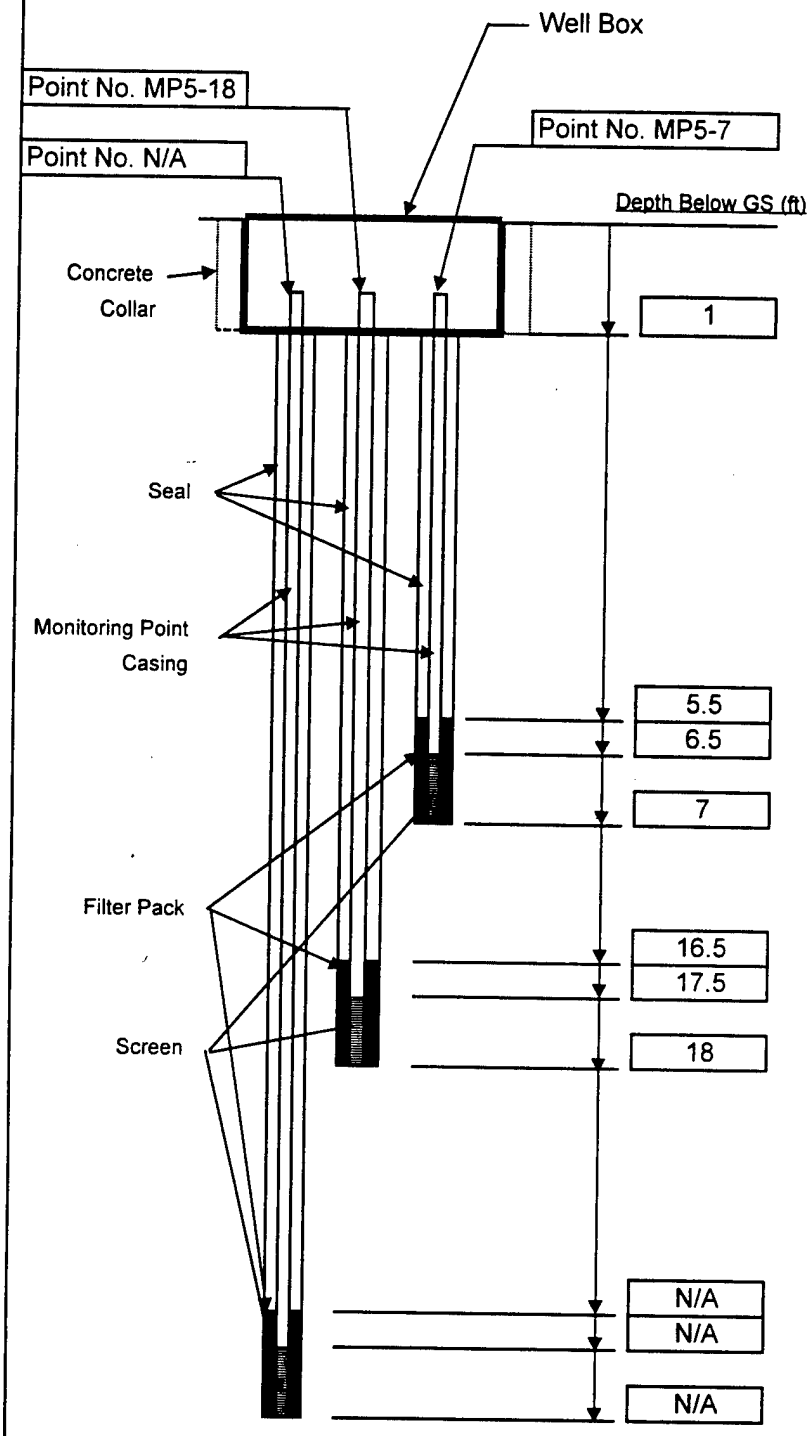
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-5* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *18* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point* See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-18ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-5 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: 9/11/1998 | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: 9/11/1998 | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

**Monitoring Point Casing**

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

**Seal**

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

**Screen**

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

**Borehole**

| | |
|---|---|
| Diameter (in.) | 3 |

**Concrete Collar**

| | |
|---|---|
| Outer Diameter (in.) | N/A |

**Well Box**

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

## SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-5-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-5-18 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

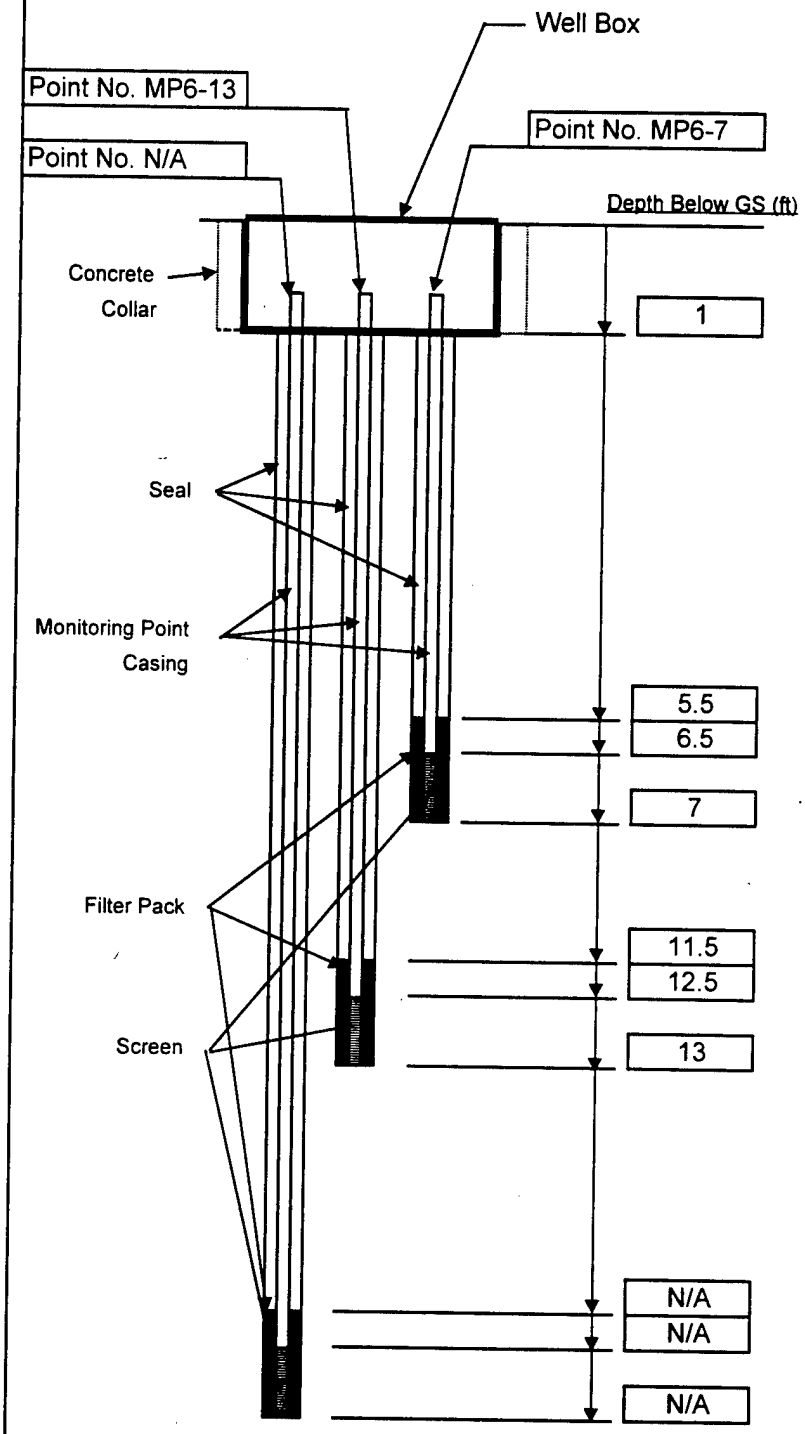
# BOREHOLE LOG

| | | |
|---|---|---|
| *Project Name: Loring AFB* | | *Borehole No.: MP-6* |
| *Project Number: 22784* | *Elevation:* TBD | |
| *Location: JEBS* | *Date Started:9/11/98* | *Date Completed: 9/11/98* |
| *Driller: Great Works Drilling* | *Total Depth (ft):* | *13* |
| *Equipment: Mobile B59* | *Depth to Bedrock (ft):* | *None* |
| *Drilling Method: Hollow Stem Auger* | *Hole Diameter (in):* | *3* |
| *Drilling Fluid: None* | *Depth to Water (ft):* | *TBD* |
| *Completion: Completed as SVE Monitoring Point* See Construction Log for details | *Logged By: E. Berglund* | |

| Depth (ft) | Description | Sample Number | Sample Type | Blow Count | Comments |
|---|---|---|---|---|---|
| 5<br>10<br>15<br>20<br>25<br>30 | 0-13ft: **Gravelly clayey silt:** *(ML)*, Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist. | | | | No samples required. |

# SVE MONITORING POINT CONSTRUCTION LOG

| | | |
|---|---|---|
| Loring AFB | Site: JEBS | Point Location No. MP-6 |
| Drilling Company: Great Works Drilling | Project No.: 22748 | Logged By: E. Berglund |
| Driller: D. Bolstridge | Date Started: ####### | Coordinates: TBD |
| Drilling Equipment: Mobile B59 | Date Completed: ####### | |
| Drilling Method: Driven Point | Depth to Water: TBD | |
| Drilling Fluid: None | Elevation: TBD | |




## MATERIALS

**Monitoring Point Casing**

| | |
|---|---|
| Type | Polyethylene |
| Diameter (in.) | 1/4 |

**Seal**

| | |
|---|---|
| Type | Bentonite Granules |
| Placement | To surface |

**Filter Pack**

| | |
|---|---|
| Type | 10-20 Silica sand |
| Placement | 1.5 |

**Screen**

| | |
|---|---|
| Type | Double woven stainless steel |
| Diameter (in.) | 1/4 |

**Borehole**

| | |
|---|---|
| Diameter (in.) | 3 |

**Concrete Collar**

| | |
|---|---|
| Outer Diameter (in.) | N/A |

**Well Box**

| | |
|---|---|
| Material | Steel |
| Diameter (in.) | 12 |
| Depth (in.) | 12 |

## SPECIFIC POINT INFORMATION

| | |
|---|---|
| Point Number | MP-6-7 |
| Screen Length (ft) | 0.5 |
| Point Number | MP-6-13 |
| Screen Length (ft) | 0.5 |
| Point Number | N/A |
| Screen Length (ft) | |

# APPENDIX C

# SVE EQUIPMENT INSPECTION

007865

**Interoffice Memorandum**

To Distribution

Subject SVE Equipment Inspection - Air Components

File No.

Date October 19, 1998

From David Wagner DMW

Of AFCEE

Copies to

At Ext. 2190

A site visit was conducted at Air Components (Grand Rapids, MI) to inspect the soil vapor extraction skid that will be installed at Loring Air Force Base. Del Stambach, of Air Components, was the contact that provided the inspection tour. The following is a summary of the visit/equipment inspection:

1. The equipment was checked against the design figures and equipment cut sheets that had been previously provided as submittals. The equipment layout and material correlated to the information provided.
2. The Erdco flowmeter was found to be absent on the skid. The expected shipping date for this item is November 4, 1998. The skid can be operated without this item.
3. The equipment was operated to check for excessive noise/vibration, etc., and was found to operate satisfactorily.
4. The system vacuum was observed to be 0.5 psig with no resistance on the blower.
5. The system was tested at 12-in Hg and the motor amperage was observed to be 72 amps.
6. The level switches in the air/water separator were tested to ensure transfer pump operation. The switches and transfer pump operated as designed.
7. The control panel was visually inspected and found to be of professional construction.
8. The 250-gallon water storage tank was inspected and found to be a in vertical configuration. The tank is approximately 8-ft high, with a loading hook attached at the top.

In general, the equipment was found to be professionally designed and of quality construction. The only outstanding equipment issue is the lack of the Erdco flowmeters. The equipment is still operational without these items, and it is my recommendation that the equipment be shipped to the Loring site as soon as possible. The vendor thought that shipment on October 19-20 was a reasonable date.

# APPENDIX D

# REQUEST FOR INFORMATION No. 292

# REQUEST FOR INFORMATION (RFI)

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006 RFI NO: 292

LOCATION: Limestone, Maine PAGE 1 OF 1

TO: John Mueller OF: AFCEE/ERB-L

| REFERENCE DRAWING: N/A | SPECIFICATION: N/A |
|---|---|

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:

Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund

REPLY REQUIRED BY: 9/15/98

| 9-Sep-98 | BEI |
|---|---|
| DATE | CONTRACTOR |

## INFORMATION TO CONTRACTOR

| TO: | FROM: |
|---|---|
| OF: | OF: |

REQUESTED INFORMATION:

| DATE | AFCEE/ERB-L |
|---|---|

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dimbauer, Ed Trujillo
Denis St. Peter

## Dub, Andrea

**From:** dpeter@afbda1.hq.af.mil
**Sent:** Wednesday, September 09, 1998 4:13 PM
**To:** aadub@bechtel.com; John.Mueller@hqafcee.brooks.af.mil
**Cc:** cadirnba@bechtel.com; extrujil@bechtel.com
**Subject:** re: Open RFI's

Thanks for the reminder. I agree with the following RFIs:
RFI 288 - Approval to proceed excavating/stockpiling barrier soil from misc areas for use on Landfill 3
RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan
RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and VMB
RFI 292 - Approval to not install surface seal at JEBS

---

Original Text
From: "Dub, Andrea" <aadub@bechtel.com>, on 9/9/98 1:12 PM:
To: Denis St Peter@Loring@AFBDA.OLM

Denis, I think the RFI's listed below may belong to you. Could you advise as to the status and if they are not in your area, please advise as to whom I should contact. thank you - Andrea

RFI 288 - Approval to proceed excavating/stockpiling barrier soil from misc areas for use on Landfill 3
RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan
RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and VMB
RFI 292 - Approval to not install surface seal at JEBS

# REQUEST FOR INFORMATION (RFI)

PROJECT NAME: AFCEE - Loring

JOB NO. 22784-006 RFI NO: 292

LOCATION: Limestone, Maine PAGE 1 OF 1

TO: John Mueller OF: AFCEE/ERB-L

| REFERENCE DRAWING: N/A | SPECIFICATION: N/A |
|---|---|

LOCATION: Jet Engine Buildup Shop SVE System

INFORMATION REQUESTED: Install no surface seal at JEBS SVE System well field until it can be determined if necessary to do so. Frozen ground during the winter season will provide a natural surface seal. Well performance, as measured by vacuum and flow, will be recorded during this period and compared to data recorded at startup and during and after spring thaw. Differences in well performance measured during frozen ground conditions (natural surface seal) and unfrozen ground conditions (no surface seal) will indicate if a well is short-circuiting to the surface. Wells that indicate short-circuiting will be provided with a area specific surface seal.

REASON REQUESTED:

Cost savings by significantly reducing the total area of surface seal needed.

REQUESTED BY: Eric Berglund

REPLY REQUIRED BY: 9/15/98

9-Sep-98 BEI

DATE CONTRACTOR

## INFORMATION TO CONTRACTOR

| TO: Eric Berglund | FROM: John Mueller |
|---|---|
| OF: BEI | OF: AFCEE |

REQUESTED INFORMATION:

Approved per the attached email from AFBCA, Denis St. Peter.

9-14-98 AFCEE/ERB-L

DATE

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo
Denis St. Peter